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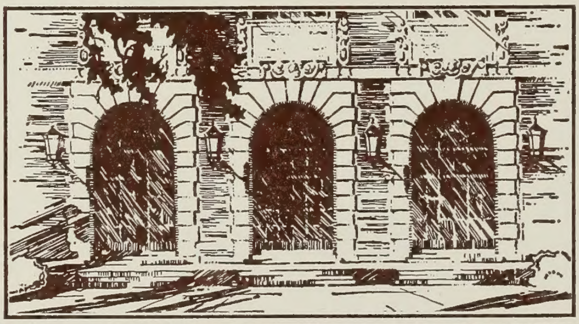

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Volume 4 Index Issue, 1969

GASTROENTEROLOGY ABSTRACTS AND CITATIONS

A monthly publication of the
National Institute of Arthritis and Metabolic Diseases

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PREFACE

GASTROENTEROLOGY ABSTRACTS and CITATIONS is a publication of the National Institute of Arthritis and Metabolic Diseases. This specialized information medium has been initiated to fill an existing great need in the field of gastroenterology and to assist the Institute in meeting its obligations to foster and support laboratory and clinical research into the nature, causes, and therapy of diseases of the gastrointestinal tract. Publication of GASTROENTEROLOGY ABSTRACTS and CITATIONS makes available citations of all current papers relevant to this field from medical journals published throughout the world. Approximately one-third of the citations dealing with the major aspects of gastroenterology has accompanying abstracts.

The issuing of GASTROENTEROLOGY ABSTRACTS and CITATIONS under the auspices of the National Institute of Arthritis and Metabolic Diseases will provide a much needed current awareness tool to scientists and will facilitate greater integration of research and clinical efforts in this field. The number and great diversity of publications in the area of gastroenterology makes it imperative that an appropriate service be available to investigators and practitioners so that they may be apprised of progress with a minimum of delay. Our aim is to provide the readers with a readily systematized compilation of current published work. The publication will provide the greatest usefulness if these interested investigators will contribute their ideas and comments for consideration whenever possible.

GASTROENTEROLOGY ABSTRACTS and CITATIONS is published monthly and includes citations and abstract from the biomedical world literature as they are currently received. In addition, yearly cumulated subject and author indexes are published.

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PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

1 **IMMUNOFLUORESCENT STUDY OF CELLS FROM THE LIVER AND CERTAIN OTHER ORGANS OF RATS.** *(Rus.)* Kashkin, K. P. (Inst. Med. Radiol., Acad. Med. Sci. USSR, Obninsk) and V. S. Kondrat'iev. *Arkh Anat* 55(10):87-90, 1968.

Liver slices from rats of the August line were incubated with isothiocyanate-fluorescein-labeled serum from rabbits immunized to rat liver microsomes, mitochondria, and hyaloplasm. Labeled antibodies were selectively fixed on the corresponding structures in the hepatic cells. No fluorescence was seen in the cytoplasm or nuclei of endothelial cells in the blood vessels, Kupffer's cells, or epithelial cells in the bile ducts. The possibility that this fluorescence is nonspecific was ruled out by first treating the sera with powdered rabbit liver. Similar but less clear-cut results were obtained with the indirect Coons' test in which the fixation of unlabeled antikidney antibodies was demonstrated by treating the specimens with fluorescent serum from pigs immunized with serum immunoglobulins from rabbits. The direct Coons' test showed that the antigenic properties of some components in the nucleoli of hepatic cells were similar to those of cytoplasmic granules. In a study of sections from the rat pancreas, stomach, intestines, kidneys, and brain, antikidney antibodies were selectively fixed only in the cytoplasm of epithelial cells in the convoluted tubules of the kidney. These kidney cells did not fix rat antibrain or antispleen antibodies. Similarities in the antigenic properties of liver and kidney cells may be due to excretion of degradation products from the liver by cells of the convoluted tubules.

2 **PEPTIDE HYDROLASE ACTIVITIES OF THE MUCOSA OF HUMAN SMALL INTESTINE.** *(E.)* Heizer, W. D. (Natl. Inst. Arthr. Metab. Dis., NIH, Bethesda, Md.) and L. Laster. *J Clin Invest* 48(1):210-228, 1969.

Assay of hydrolase activities in mucosal biopsies of the small intestine from 3 patients with subtotal villous atrophy showed a reduction in glycyl-L-proline and L-phenylalanyl-L-proline hydrolases. A less marked reduction was noted in 13 patients with various intestinal disorders. Two new methods were used in these studies: a method for rapid screening of tissue extracts for hydrolase activity by use of high-voltage paper electrophoresis, and a method for quantitating the hydrolysis of dipeptides containing L-phenylalanine, L-tyrosine or L-tryptophan. In 10 normal subjects, the intestinal mucosa showed varying degrees of hydrolase activity for many peptides, and the L-alanyl-L-phenylalanine hydrolase activity was about 10 times as high as activity for the other 3 substrates studied quantitatively (the foregoing and L-phenylalanylglycine). A comparison of the activity of normal intestine (1) and diseased intestine (1) with their combined activity revealed no evidence of enzyme inhibitors or activators. These studies suggest that intestinal disorders can produce a nonspecific reduction in the peptide hydrolase activities of the mucosa of the small intestine, but that the pathophysiologic changes associated with flattening of the mucosa tend to reduce imidopeptide hydrolase activities selectively.

3 **MORPHOLOGICAL AND HISTOCHEMICAL STUDY OF EMBRYONIC CAT LIVERS.** *(Rus.)* Ovsepian, S. A. (Erevan Med. Inst., USSR). *Zh Eksp Klin Med* 8(2):34-40, 1968.

Livers from 42 cat embryos, weighing 6-100 g, were examined microscopically and histochemically. In embryos weighing 6-10 g most of the liver cells had small round or oval nuclei with large amounts of chromatin, densely packed and random DNA granules, and little RNA. Cells with medium-sized and large nuclei developed from them. The DNA granules in their nuclei were found in the chromatin layer of the nuclear membrane, around the nucleoli, and in the chromatin strands. The amount of RNA increased during development. Glycogen and iron salts first appeared in the protoplasm of cells with medium-sized and large nuclei, reaching a maximum right before birth. None of the lobed structures were evident until a few days before birth.

4 **THE DIETARY REGULATION OF THE GLYCOLYTIC ENZYMES. II. ADAPTIVE CHANGES IN HUMAN JEJUNUM.** *(E.)* Rosensweig, N. S. (Fitzsimmons Gen. Hosp., Denver, Colo.), F. B. Stifel, R. H. Herman and D. Zakim. *Biochim Biophys Acta* 170(2):228-234, 1968.

The effects of dietary fructose, sucrose, glucose, a carbohydrate-free diet and fasting on human jejunal fructokinase, fructose-1-phosphate aldolase, hexokinase, glucokinase and fructose-1,6-diphosphate aldolase activities were determined in 4 normal male Caucasian volunteers (19-23 yr old) and 2 obese patients (1 Negro, age 34 and 1 Caucasian, age 31). All subjects were fed diets varying in carbohydrate, fat, and protein composition, and jejunal biopsies were performed toward the end of the dietary period (1-27 days). The activities of fructokinase and fructose-1-phosphate aldolase were highest on the fructose diet, and decreased on sucrose, glucose or carbohydrate-free diets and fasting, in that order. Hexokinase and glucokinase activities were highest on the glucose diet and decreased on sucrose, fructose or carbohydrate-free diets and fasting, in that order. A comparison of the effects of the different carbohydrate diets on the ratio of fructose-1,6-diphosphate aldolase activity to fructose-1-phosphate aldolase activity in the 4 normal subjects revealed the ratio to be highest on glucose and lowest on fructose, with an intermediate value for sucrose. These results are similar to those found in the rat, and indicate that specific dietary sugars can increase specific jejunal glycolytic enzymes in the human.

5 **STRUCTURE OF ANTRAL GASTRIC MUCOSA.** *(E.)* Ferguson, D. J. (Dept. Surgery, U. Chicago, Ill.). *Surgery* 65(2):280-291, 1969.

Antral biopsies from living human subjects (45 of both sexes, 15-81 yr old, with normal stomach, peptic ulcer or gastric carcinoma), dogs (6 with an isolated antral pouch; 4 after transplant of antral patches into the colon) and mice (3 A-strain males) were examined by electron and light microscopy in order to correlate histologic structure with the known functions of the antral mucosa. S cells, characterized by prominent, oriented bundles of fibrils in the supranuclear region, were found in the foveolae and superficial glands of the antral mucosa of 8 human subjects (all with normal or high acid secretion) and in all dogs and mice examined. None were present in the fundic or cardiac mucosa or in the duodenum of these species. Many vesicles containing little or no stained material and surrounded by a membrane which appeared identical to the plasma membrane were observed among the fibrils. The distribution of S cells and the intracellular orientation of the fibrils and their presence in microvilli suggest a sensory function. The supranuclear vesicles could be the result of pinocytosis. Variations in species appearance of the S cells (fibrils less prominent in man than in the other species) might be related to differences in antral function. Argyrophil cells were present in most antral specimens. Nonmucous, BH-negative E cells, containing numerous pale-staining granules, were observed in the glands near the foveolae in man and dog and in the single layer of glands in mice. They occurred in greater size and number in the defunctionalized canine antrum; stimulation with meat extract decreased their average diameter. Samples of antral mucosa transplanted to the colon revealed only equivocal differences from normal. In 5 achlorhydric human stomachs examined, E cells were scarce in the antral mucosa, while they were abundant in samples from stomachs of 6 persons secreting normal or large amounts of acid. Secretion and storage of gastrin may be attributed to some variant of the E cell.

6 THE ULTRASTRUCTURE OF THE MUCOSAL INNERVATION OF THE STOMACH. *(Ger.)*

Lick, R. F. (Surg. Polyclin., U. Munich, Germany), A. Halaris, D. Balser, W. Hart and I. Klempa. *Z Gastroent* 6(5):342-347, 1968.

Electron microscopy of mucosa taken from the gastric corpus and antrum of 5 male Sprague-Dawley rats revealed bundles of nonmedullated fibers in the intercellular spaces. These axons, which were embedded in the cell membrane of Schwann cells, were often but not always found accompanied by blood vessels near the adelomorphous (chief) and delomorphous (parietal) cells. Since many of these nerve cells contained synaptic vesicles, they are probably efferent in nature. The axoplasm also contained nerve fibrils and mitochondria. Some of the "synaptic vesicles" contain acetylcholine while others probably contain catecholamines and/or serotonin. This suggests that there is no sharp distinction, either morphologically or functionally, between cholinergic and adrenergic nerve fibers. No specific synaptic structures were found between nerve cells and secretory cells, even when they were only a few hundred angstroms apart, indicating that transmission must be humoral in nature. No evidence was found to show whether the nerve fibers were pre- or postganglionic.

7 ULTRASTRUCTURE AND FUNCTION OF GASTRIC PARIETAL CELLS IN THE RAT DURING DEVELOPMENT.

(E.) Helander, H. F. (Dept. Anat., U. Umea, Sweden). *Gastroenterology* 56(1):35-52, 1969.

Three different aspects of the development of the gastric mucosa were investigated in infant Sprague-Dawley rats: pH of the gastric contents after histamine stimulation (0.2 mg/g body weight, s.c.), activity of carbonic anhydrase in stomach homogenates, and ultrastructure of the epithelial and particularly the developing parietal cells. Gastric pH decreased from 5.3 immediately after birth to 2.7 in 10-day-old rats. Carbonic anhydrase activity was first demonstrated in embryos on the 20th day of gestation. Electron microscopy revealed that primitive parietal cells could be identified at 20 days of gestation, and were characterized by intracellular canaliculi lined with microvilli, cytoplasm with moderate mitochondria, numerous ribosomes, moderately well developed rough endoplasmic reticulum, and a few dense granules. The dense granules disappeared before 10 days of age with a concomitant increase in cytoplasmic vacuoles. Lysosome-like bodies were frequently found during the 1st 10 days after birth. It is suggested that a dense substance, often observed in the parietal cell canaliculi of the developing rats, could be a carrier for hydrochloric acid.

8 ULTRASTRUCTURE AND FUNCTION OF GASTRIC MUCOID AND ZYMOGEN CELLS IN THE RAT DURING DEVELOPMENT.

(E.) Helander, H. F. (Dept. Anat., U. Umea, Sweden). *Gastroenterology* 56(1):53-70, 1969.

Peptic, milk-clotting and lipase activities were measured in whole homogenates of stomachs from Sprague-Dawley rats of the following ages: 0-6 hr; 1, 3, 5, and 10 days; and 3-6 months (adults); embryos of 17-21 days gestation were also used. Newborn rats were taken before they had sucked, rats 1-10 days old were fasted for 16 hr, and adult rats were fasted for 48 hr prior to sacrifice. The fine structure of the gastric mucosa was studied in at least 4 animals of each group. The 1st traces of peptic activity were evident in 18-day-old embryos, while lipase and milk-clotting activities were detected 2 days later Three days before birth there was a 5-fold increase in peptic activity, but in newborn rats it dropped to 60% of the 21-day-old embryo value. From 1-10 days of age the peptic activity changed little; at 10 days it was 60% of that in adults. The lipase activity developed similarly to the peptic activity, except that there was no drop in activity at birth; at 10 days the lipase activity was 55% of that in adults. The milk-clotting activity was 4 times as high in the newborn as in embryos 2 days before birth; from 1-10 days after birth the activity changed little. In adults, a drop to ¼ of the activity found in 10-day-old rats was noted. Electron microscopy revealed primitive surface epithelial and mucous neck cells at 20 days of gestation; zymogen granules could be identified 1 day later. The mucous neck cells matured in 1-2 days. Surface epithelial cells were mature 1 day before birth, except for cytoplasmic accumulations of glycogen. At birth the zymogen cells contained numerous secretory granules which decreased over the next 10 days. At 20 days of age, zymogen cells attained a normal, adult appearance. Intermediate cell forms between the mucous neck cells and other exocrine cells were common. This supports the theory that the gastric epithelial cells may differentiate from dividing mucoid cells. Zymogen and mucous neck cells are the most likely sources for the gastric digestive enzymes.

9 PRESENCE AND MOBILIZATION OF GLYCOGEN IN MAMMALIAN PANCREATIC β CELLS.

(E.) Hellman, B. (Dept. Histol., U. Umea, Sweden) and L. A. Idahl. *Endocrinology* 84(1):1-8, 1969.

A quantitative microchemical technique was used for the measurement of glycogen in the pancreatic islet cells of 47 6-month-old obese hyperglycemic mice and 12 of their lean litter mates; in addition, 6 adult male rats and 4 Chinese hamsters were studied. The technique combined an enzymatic method based on the reactivity to glycogen phosphorylase with final fluorometric measurements of small amounts of NADPH by enzymatic cycling. Glycogen could be demonstrated in the pancreatic islets from all animals included in the investigation. A glycogen content of 10.2 ± 0.9 mmoles/kg dry weight was recorded in whole islets that had been directly microdissected from the fresh pancreases of untreated obese hyperglycemic mice. A similar analysis of the lean litter mates revealed 3.6 ± 0.4 mmoles/kg dry weight, compared to 1.0 ± 0.1 mmoles in the rat and 4.9 ± 0.2 mmoles/kg dry weight in the Chinese hamster. Pure β-cell specimens obtained by dissection of freeze-dried pancreas sections contained 13.9 ± 2.4 mmoles glycogen/kg dry weight. Values in the exocrine parenchyma ranged from 0.2 to 0.8 mmoles/kg dry weight and the presence of glycogen in the exocrine pancreas cannot be considered established. Low glucose levels were incompatible with the establishment of significant glycogen stores in the β cells. Although the glucose level of the β cells remained practically unchanged after 5 min of ischemia, the glycogen level fell by 3 mmoles/kg or more. Exposure to glucagon under various experimental conditions did not markedly affect the glycogen stores.

10 INVESTIGATION OF THE HEPATIC MATERIAL "SPACE" UNDER VARIOUS CONDITIONS OF FLOW IN THE ISOLATED PERFUSED DOG LIVER. *(E.)*

Field, C. D. (Dept. Physiol., U. West Indies, Jamaica) and W. H. Andrews. *CircRes* 23(5):611-622, 1968.

A radioactive isotope dilution technique, in which 2 radioactive tracers were used simultaneously, was employed to investigate the nature of the hepatic arterial vascular bed or arterial vascuar "space" in 22 isolated perfused canine livers. The technique continuously monitored the blood leaving the liver for radioctivity. The concept of an arterial vascular space was defined n terms of the mean circulation time of labeled red blood cells hrough the perfused organ, and the variation of this parameter with variations in arterial flow was considered. Determinations of the size of the arterial vascular space showed a linear relation etween the arterial fraction of the blood occupying the total ascular bed and the arterial fraction of the total hepatic blood low. The evidence from these experiments supports the idea hat the hepatic artery and portal vein share a large proportion f the total hepatic vascular bed.

1 THE NORMAL HUMAN GASTRIC EPITHELIA: A FINE STRUCTURAL STUDY. *(E.)*

Rubin, W. Cornell U. Med. Coll., New York, N. Y.), L. L. Ross, M. H. leisinger and G. H. Jeffries. *Lab Invest* 19(6):598-626, 1968.

When normal human gastric biopsies obtained from 19 fasting ubjects (17-63 yr old) were examined by electron microscopy, types of epithelial cells could be characterized by their fine-tructural features: 1) surface and pit cells, 2) undifferentiated eck cells, 3) parietal cells, 4) chief cells, 5) mucous gland mucous neck) cells, and 6) pyloric gland cells. The undifferntiated neck cells, located in the bases of the pits and upper egions of the glands, exhibited large nuclei, prominent nucleoli, n abundant cytoplasmic matrix, numerous ribosomes and polyomes, few mucous granules (usually small), and relatively few itochondria and profiles of endoplasmic reticulum (most of hich was agranular). The development of surface pit, parietal, mucous gland, and pyloric gland cells from these undifferentiated neck cells was suggested by the presence of intermediate forms in this same region in the upper glands and pit bases. The tubulovesicles in parietal cells resembled the plasmalemma of the luminal and canalicular surfaces, along which they were predominantly distributed. The tubulovesicles appeared distinct from the endoplasmic reticulum and contained numerous small pieces of cytoplasm. Pyloric gland cells resembled mucous gland (mucous neck) cells but contained a second type of granule resembling that of the chief cells.

12 DIETARY REGULATION OF GLYCOLYTIC ENZYMES. I. ADAPTIVE CHANGES IN RAT JEJUNUM. *(E.)*

Stifel, F. B. (Fitzsimons Gen. Hosp., Denver, Colo.), N. S. Rosensweig, D. Zakim and R. H. Herman. *Biochim Biophys Acta* 170(2):221-227, 1968.

Glycolytic enzyme activity was investigated in jejunal mucosa and liver tissue from adult male Holtzman rats which were fasted or fed diets containing 68% fructose, sucrose, glucose or casein for 3 days. Jejunal fructokinase, fructose-1-phosphate aldolase, hexokinase and glucokinase each showed maximal activity when its specific substrate was fed, while fructose-1,6-diphosphate aldolase activity was similar in the fructose-, glucose- and sucrose-fed rats. Aldose reductase activity was highest on glucose and lowest after fasting. Similar results were observed in hepatic enzymes, except that the glucokinase activity in the livers of sucrose-fed rats was intermediate between that of glucose- and fructose-fed animals. In both tissues, enzyme activities were uniformly lowest in the fasted group, and casein produced a nonspecific increase in all enzymes studied. Fasting activities of fructokinase and fructose-1-phosphate aldolase were higher in liver than in jejunal tissue. The observation that the ratio between fructose-1,6-diphosphate aldolase and fructose-1-phosphate aldolase was only 0.66 in the jejunum of fructose-fed rats (compared to 2.76 on a glucose diet and about 1.0 in the liver regardless of diet) may mean that the intestine contains an aldolase with properties different from those of other tissues.

13 HISTOLOGICAL AND HISTOCHEMICAL INVESTIGATIONS ON THE STOMACHS IN MAN, JAPANESE MONKEY (*Macaca fuscata yakui*) AND SOME OTHER KINDS OF ANIMALS. REPORT IV. A NEW SECRETION TYPE IN THE PARIETAL CELL. *(E.)*

Imai, M. (Sch. Dent., Aichi-Gakuin U., Chikusa-ku, Nagoya, Japan), T. Shibata and T. Mineda. *Okajima Folia Anat Jap* 45(4):165-173, 1968.

Droplet-like swellings which stained positively with fuchsin were observed in the periphery of parietal cells fronting the lamina propria, in the lamina propria, and in the lumens of capillaries of the same tissue in gastric sections from adult Japanese monkeys and adult dogs stained by Hamazaki's KFJ method, and to a lesser extent in preparations fixed by buffered formalin and stained by Hamazaki's carbol-fuchsin. The droplets were found more frequently in fasting animals than in fed animals, and could also be identified in the fasting dog by phase contrast microscopy of fresh parietal cells. The staining properties were unaffected by lipase digestion of treatment with baryta water. Many fuchsin-positive granules, distinct from the periodic acid-Schiff positive coarse granules (Lille's method), were found at the periphery of the parietal cells. It is thought that the fuchsin-positive droplets probably separate from the cell and that the secretion penetrates the basal membrane to enter the lamina propria, thus arriving at the blood capillaries.

14 EPITHELIAL CELL MIGRATION IN THE INTESTINE OF THE YOUNG MOUSE. *(E.)*
Grey, R. D. (Dept. Biol., Washington U., St. Louis, Mo.). *Develop Biol* 18(5):501-514, 1968.

Epithelial cell migration in the duodenum of nursling white Swiss mice was studied by injecting 2 μC/g body weight of tritiated thymidine into 11-, 16-, and 20-day-old animals and then sacrificing them at intervals (24, 48 and 96 hr after injection). Autoradiographs of the duodenal sections indicated that significant epithelial cell migration occurs at stages when critical maturational changes are taking place in the epithelial lining of the duodenum. By 48 hr after injection, labeled cells in the duodenum of adult mice had migrated almost the entire length of the villus, while the migration rate in all of the 3 nursling stages was slower. The actual distance (in μ) traveled in 48 hr by cells of 11- and 16-day-old mice was only 75% of that traveled by adult duodenal epithelial cells; for 20-day-old mice, the distance was 65% of that of the adult. Most of the heavily labeled cells had been extruded from the villi by 96 hr in all animals except those injected at 20 days. By 24 days after birth, the length of the villi equals or exceeds the adult length. However, the distance of cell migration during 48 hr does not increase with age during the preweaning stages and even falls slightly, but significantly, at 20-24 days. Since the villi elongate and the migration rate does not increase, a gradual increase occurs in the time required for a cell to migrate from the intestinal crypt to the villus tip. The rate of cell migration was much slower in the 20-day jejunum than in duodenum at the same stage. These findings suggest that the process of villus elongation before weaning is regulated in the mouse duodenum by changes in the rate of cell extrusion from the villus tip. The possible role of hormones as regulators of the rates of cell production or extrusion is discussed.

15 ADRENERGIC FIBERS IN THE HUMAN INTESTINE. *(E.)* Capurso, L. (St. Mark's Hosp., London, England), C. A. Friedmann and A. G. Parks. *Gut* 9(6):678-682, 1968.

Histofluorescent methods specific for acetylcholinesterase and catecholamines were used to study 22 macroscopically normal samples of intestinal muscle and 7 samples of mucosa from patients with rectal carcinoma. Examination showed that the human myenteric plexus contains cellular elements which are enveloped by structures rich in catecholamines and suggest ganglia. Some adrenergic fibers appear to originate in the myenteric plexus and terminate in the longitudinal and circular muscles, but the muscle coats are not very rich in adrenergic innervation. Some norepinephrine-containing granules were found along the nerve fibers, and some adrenergic structures were also found in the mucosa.

16 ON THE HISTOCHEMISTRY OF HEPATOCYTES FOLLOWING THE TREATMENT WITH HORMONES AND HORMONE SYNTHESIS BLOCKING SUBSTANCES. *(E.)* Marzotko, D. (Inst. Anat., Martin Luther U., Halle/Saale, Germany). *Folia Histochem Cytochem* 6(2):213-236, 1968.

The influence of intragastrically administered thyroxine, triiodothyronine, diiodotryosine, methylthiouracil, and diiodotyrosine plus methylthiouracil on the content and distribution of liver glycogen and RNA was investigated in 96 male albino rats over a period of 45 days. In animals given 3 ml of 0.85% NaCl solution/kg/day, the glycogen content fluctuated considerably, although metabolic activity varied only slightly as indicated by the accumulation of glycogen by hepatocytes in the peripheral portions of the lobules. Changes in RNA content followed the same course as those of glycogen. Thyroxine (100 μg) and triiodothyronine (100 μg) induced increased peripheral accumulation of glycogen as early as the 1st day, with depletion on subsequent days. The early occurrence of foci of necrosis, along with enlarged hepatocytic nuclei, smaller, darker nuclei of "exhaustion cells" and pyknotic nuclei of moulting cells indicated functional liver impairment. The RNA content was temporarily reduced. Following the administration of 500 μg or 5 mg of diiodotyrosine, glycogen was abundant the first 1-2 days and fluctuated thereafter. In methylthiouracil-treated animals (25 mg) there was an absolute decrease in hepatic metabolism, particularly in glycogen synthesis. When the last 2 agents were given together, the liver appeared histologically less damaged than after methylthiouracil alone. However, the smaller dose of diiodotyrosine seemed to have a stronger protective action.

17 INTESTINAL VILLI: FORM AND MOTILITY IN RELATION TO FUNCTION. *(E.)* Sessions, J. T. Jr. (U. North Carolina Sch. Med., Chapel Hill) S. R. Viegas de Andrade and E. Kokas. Pp. 248-260 in *Progress in Gastroenterology*. Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

18 ELECTRON MICROSCOPY OF HUMAN GASTRIC MUCOSA. *(E.)* Lillibridge, C. B. (Genesee Hosp., Rochester, N.Y.) Pp. 22-23 in *Progress in Gastroenterology*, Vol. I. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

19 "LYSOSOMAL STRUCTURES" IN THE EXOCRINE PANCREAS. *(Fr.)* Frexinos, J. (Purpan Hosp., Toulouse, France), R. Fedou and A. Ribet. *Rev Med Toulouse* 4(9):705-719, 1968.

20 STUDIES OF THE CLEAR CELLS IN THE EXCRETORY DUCTS OF THE HORSE PANCREAS. *(Ger.)* Kuch, K. (Munic. Hosp., Karlsruhe, Germany). *Z Gastroent* 6(5):361-367, 1968.

21 MONOPARTICULATE GLYCOGEN IN HUMAN LIVER. *(E.)* Babudieri, B. (High, Inst. Hlth.; Rome, Italy), U. Fagiolo and F. Tangucci. *Histochemie* 15(2): 184-186, 1968.

22 FLUORESCENCE HISTOCHEMICAL FINDINGS OF THE STOMACH WALLS IN RESPONSE TO ULCEROGENIC STIMULI IN RATS. *(E.)* Muryobayashi, T. (Fac. Med., Kyoto U., Japan), M. Fujiwara and K. Shimamoto. *Jap J Pharmacol* 18(3): 299-311, 1968.

See also: 75,76,366,482

ABSORPTION-EXCRETION

23 **INTESTINAL ABSORPTION OF AMINO ACIDS IN THE DOG.** *(E.)* Annegers, J. H. (Northwestern U. Med. Sch., Chicago, Ill.). *Amer J Physiol* 216(1): 1-4, 1969.

Solutions containing 10-75 mM glycine, methionine, or histidine plus 0-75 mM of a second amino acid were perfused through jejunal fistulas in conscious dogs and the net absorption of amino acids and fluid was determined. Perfusates were made 325 milliosmolar with NaCl or with urea and/or fructose. The absorption rate of each amino acid increased with increasing bowel lumen concentration as well as with increasing rates of fluid absorption. Glycine absorption decreased with increasing concentrations of alanine, methionine, or histidine. This decrease was not attributable to changes in perfusate NaCl concentration or net NaCl absorption. Methionine absorption was decreased similarly by glycine and by alanine, and histidine absorption was decreased by glycine, alanine, and methionine. Neither lysine nor glutamic acid reduced glycine, methionine, or histidine absorption.

24 **EFFECT OF CARBONIC ANHYDRASE INHIBITORS ON ISOLATED RABBIT GALLBLADDERS.** *(E.)* Wheeler, H. O. (Coll. Phys. Surg., Columbia, Columbia U., New York City), E. D. Ross and K. K. King. *Amer J Physiol* 216(1):175-178, 1969.

Isolated rabbit gallbladders were cannulated and suspended in an apparatus so that net water flux from mucosa to serosa could be determined by serial measurements of the volume of the serosal bathing solution. The carbonic anhydrase inhibitors ethoxzolamide and methazolamide reduced the rate of fluid absorption by the isolated preparation. Ethoxzolamide depressed the net water flux 30-50% in bathing media containing sodium chloride, sodium bicarbonate, or both. In unilateral or "sweat" preparations (Diamond, *J. Gen. Physiol.* 48:15, 1964) permitting direct measurement of electrolyte concentrations in the transported fluid, gallbladders filled with a chloride-bicarbonate solution elaborated a fluid whose ionic composition was similar to that of the luminal contents. Ethoxzolamide reduced the volume of fluid elaborated but had no effect on its composition.

25 **LYMPHATIC ABSORPTION OF PALMITATE-1-^{14}C AND OLEATE-1-^{14}C IN THE BOVINE.** *(E.)* Cook, D. A. (Dept. Animal Sci., Iowa State U., Ames), A. D. McGilliard, J. W. Young, N. L. Jacobson and R. S. Allen. *Amer J Physiol* 216(1):41-45, 1969.

Four 15-22 week-old male Holstein calves, each surgically fitted with a rumen fistula, a reentrant duodenal fistula, and a reentrant thoracic lymph duct fistula, were employed to determine whether palmitic and oleic acids are absorbed from the stomach via the lymph. Two calves each received 569 μC oleate-1-^{14}C and 2 received 495 μC palmitate-1-^{14}C via the rumen fistula. Total collections of ingesta and lymph were made for 24 hr. Unlabeled lymph was infused to replace that collected. To prevent intestinal absorption of labeled fatty acids, total ingesta were collected from the reentrant duodenal cannula and replaced with unlabeled ingesta from a control animal. In animals receiving labeled oleate, an average of 5.8 mμC/hr appeared in the lymph during the first 12 hr. To compare the fatty acid absorption rate from the stomach and from the intestine, radioactive ingesta were returned to the duodenum during the second 12 hr of the absorption period; 1 calf received ^{14}C-oleate and 1 received ^{14}C-palmitate. An average of 4775 mμC/hr appeared in the lymph from oleate-^{14}C. The results indicate that absorption of long-chain fatty acids from the stomach via the lymphatic system is quantitatively unimportant.

26 **BIOCHEMICAL STUDY OF THE MECHANISM OF INTESTINAL ABSORPTION.** *(E.)* Casey, M. G. (Dept. Biochem., U. Med. Clin., Lausanne, Switzerland), J. P. Felber and A. Vannotti. *Amer J Proctol* 20(1):64-67, 1969.

The absorption of amino acids and sugars by the rat intestine, preloaded with substrate to a level of 0.9 μM/100 mg tissue and incubated in Krebs bicarbonate buffer or galactose in the presence of labeled substrate, was measured by following the uptake of radioactive substrate. Exchange diffusion was present for galactose with glycine, tryptophan, phenylalanine, and histidine. Exchange diffusion could not be demonstrated between galactose and proline or arginine. It appears that interaction takes place only between galactose and the neutral amino acids. Inhibition of galactose uptake by some of the neutral amino acids was observed (phenylalanine, tryptophan, histidine) but was not seen with the basic amino acids or proline. Glucose and phenylalanine absorption were almost twice normal in the alloxan-treated rat intestine, but proline absorption was not increased in this preparation. These results indicate a common transport mechanism for neutral amino acids and sugars.

27 **EFFECTS OF PRESSURE ON WATER AND SOLUTE TRANSPORT BY DOG INTESTINAL MUCOSA *IN VITRO*.** *(E.)* Hakim, A. A. (Dept. Physiol., U. Minnesota, Minneapolis) and N. Lifson. *Amer J Physiol* 216(2):276-284, 1969.

Sheets of dog small intestinal mucosa consisting only of epithelium and lamina propria were mounted on a cylindrical glass tube and immersed in a glucose-containing Krebs-bicarbonate-Ringer solution. Pressure, either mucosal or serosal (depending on how the specimen was oriented), was provided by adjustment of the relative heights of the surfaces of the bathing solutions. The relation between hydrostatic pressure and fluid transport in this system was then investigated in detail. The rate of fluid absorpiton was not affected by excess mucosal pressures up to 20 cm H_2O, but an excess serosal pressure of about 4 cm H_2O reduced fluid transport to zero, and higher serosal pressures reversed absorption to secretion. Excess serosal pressure probably increased the hydraulic permeability coefficient by widening existing channels or opening new ones. The kinetics of solute transport during the secretory flow are consistent with this view. The possible relevance of this asymmetry in pressure sensitivity to intestinal function *in vivo* is discussed, along with some misconceptions regarding the interpretation of unidirectional flutes of water during intestinal absorption or secretion.

ABSORPTION-EXCRETION

28 **EFFECT OF NEOMYCIN ON CHOLESTEROL LEVELS AND BILE ACID EXCRETION IN GERMFREE AND CONVENTIONAL RATS.** *(E.)* Eyssen, H. (Rega Inst. Med. Res., Louvain, Belgium), E. Sacquet, E. Evrard and J. Van den Bosch. *Life Sci* 7(21):1155-1162, 1968.

To determine whether the hypercholesterolemic effect of neomycin in rats is due to its antimicrobial action, the effect of neomycin on cholesterol levels and bile acid excretion was compared in germfree and conventional rats. Germfree rats on either a 1% cholesterol diet for 21 days or a 1% cholesterol-0.1% cholic acid diet for 17 days exhibited serum and liver cholesterol levels which were 50-100% higher than those of comparable conventional controls. Administration of neomycin to rats on a 1% cholesterol-0.1% cholic acid diet increased serum cholesterol levels by 100% and liver cholesterol levels by 50% in conventional animals but had no effect on the already high cholesterol levels of the germfree group. Neomycin did not affect the fecal bile acid or sterol output of germfree rats but significantly reduced the fecal bile acid loss in the conventional group. The effect of neomycin on cholesterol and bile salt absorption thus depends on the presence of an intestinal flora.

29 **STUDIES OF THE PERFUSION TECHNIQUE FOR COLONIC ABSORPTION.** *(E.)* Devroede, G. J. (Mayo Grad. Sch. Med., U. Minnesota, Rochester) and S. F. Phillips. *Gastroenterology* 56(1):92-100, 1969.

In 12 healthy male volunteers (22-50 yr old) carrying 4-lumen polyvinyl tubes positioned with the terminal orifice in the cecum, the development of steady-state conditions, reflux of perfusion solutions from cecum to ileum, and the volume of fasting ileal contents traversing the ileocecal junction were studied by sequential analysis of rectal and ileal fluids during colonic perfusion at different rates (5, 10, or 16 ml/min). A steady state was considered to have been attained when the concentration of polyethylene glycol, ^{24}Na, and electrolytes in rectal recoveries collected each 10 min for 1 hr or longer varied minimally with time; times varied from 20-110 min between subjects and even during successive perfusions in the same subject. Polyethylene glycol was present in fluid aspirated from the ileum in 3 of 10 perfusions, and the rate of reflux was calculated as 0.1-0.3 ml/min. Determinations of fasting ileal contents by suction at 2 sites in the ileum revealed a total flow rate of 0.1-0.9 ml/min. The volume of the terminal ileal contents was relatively constant and usually less than 0.1 ml/min. Dye-dilution curves demonstrated that faster infusions were associated with a reduction of total transit time through the colon and greater mean rates of flow; however, the mean volume contained in the colon was similar with perfusions of 10 or 16 ml/min. During perfusion with 154 mM sodium chloride, the concentrations of sodium and chloride decreased and those of potassium and bicarbonate increased. Changes in concentration were greatest during perfusion at 5 ml/min and decreased at faster rates. Absorption of water, sodium, and chloride and secretion of bicarbonate and potassium were greater during perfusion at 10 ml/min, but did not increase further at 16 ml/min.

30 **CONSERVATION OF SODIUM, CHLORIDE, AND WATER BY THE HUMAN COLON.** *(E.)* Devroede, G. J. (Mayo Grad. Sch. Med., U. Minnesota, Rochester) and S. F. Phillips. *Gastroenterology* 56(1):101-109, 1969.

Using the same 4-lumen polyvinyl-tube technique described above, 19 different solutions were perfused (10 ml/min) through the colon of 15 healthy male volunteers (22-55 yr old) on 59 occasions. The perfusion solutions (37C, pH 6.8-8.0) contained different initial electrolyte concentrations, but all contained 0.1% glucose, 0.5% polyethylene glycol and mannitol to preserve isotonicity. During a single intubation, 3 solutions of the same electrolytes at different concentrations were usually perfused in random order. Steady-state conditions were verified between perfusions. Sodium was absorbed from perfusates containing as little as 25 mM sodium; absorption increased significantly ($p < 0.01$) with concentrations of 75-150 mM. Chloride was absorbed more effectively than sodium, the difference being closely approximated by secretion of bicarbonate. Absorption of water was noted from 15 of the 16 sodium chloride perfusates (sodium being absorbed from all of them). Bicarbonate was secreted into solutions containing less than 25 mM sodium bicarbonate but was absorbed at progressively higher rates from increasing concentrations. Sodium and bicarbonate were absorbed in equal amounts from solutions of sodium bicarbonate. The presence of chloride increased the secretion of bicarbonate into bicarbonate-free solutions or those containing 15 mM sodium bicarbonate. The presence of chloride in solutions of 25 mM sodium bicarbonate reversed absorption into secretion. No consistent pattern of water movement was noted with sodium bicarbonate solutions. Potassium was absorbed at progressively increasing rates from solutions containing 15 mM potassium or higher, but was secreted at lesser concentrations. The presence of added sodium chloride did not significantly alter the transport of potassium from 25 mM potassium chloride. Water was always secreted into potassium chloride solutions, but addition of sodium chloride resulted in water absorption. More electrolyte than water was transported from isotonic perfusates, and when water absorption was zero, sodium and chloride absorption continued. The highly significant absorption of sodium chloride in the absence of water transport suggests that electrolyte absorption is a prime function of the human colon with water moving passively along osmotic gradients.

31 **A CONTINUOUSLY MONITORED RECIRCULATING PERFUSION SYSTEM FOR MEASURING INTESTINAL ABSORPTION.** *(E.)* Spencer, R. P. (Yale U. Sch. Med., New Haven, Conn.), T. K. Chaudhuri, T. K. Chaudhur and T. Herskovic. *Amer J Dig Dis* 14(1):61-66, 1969.

A perfusion apparatus for the continuous and simultaneous monitoring of water and nutrient (or electrolyte) absorption from the intestine is described. The system consists of a recirculating loop of polyvinyl tubing (1/8 inch outer diameter, total volume 50 ml) with a reservoir which is kept in motion by means of two Ministaltic pumps with an adjustable flow rate. The content of nonabsorbed volume indicator (1 mg/100 ml Rose Bengal) in the system is quantitated by means of a Beckman spectrophotometer peaked at 500 nm. Continuous recording of the optical density is achieved with an attached Gilford recorder. About 96% of the Rose Bengal is recovered. The electrolyte indicator is present in radiolabeled form and is quantitated by means of a gamma-ray detector. From this counting assembly, the fluid flow is led to a heat-exchanger (37C), then to a second pump and into the intestine. A second tube, which serves as the return line, opens 10 cm downstream from the delivery point of the fluid. Both the delivery and return tubes are joined to two additional tubes which are used to hold balloons to occlude the gut lumen 3 cm below the return orifice and just above the entrance orifice. Use of the system with ^{22}NaCl and ^{75}Se-L-selenomethionine is illustrated in dogs with duodenal fistulas. Beta-emitting radionuclides may also be used in the perfusing fluid if a suitable detector is employed.

32

COMPARISON OF GASTRIC ABSORPTION OF THIOPENTAL AND PENTOBARBITAL IN RAT, DOG, AND MAN. *(E.)* Hume, A. S. (Vanderbilt U. Sch. Med., Nashville, Tenn.), M. T. Bush, J. Remick and B. H. Douglas. *Arch Int Pharmacodyn* 171(1):122-127, 1968.

The rate of gastric absorption of 10 mg/kg of pentobarbital of thiopental after oral administration was investigated in 35 fasting Sprague-Dawley rats and 9 fasting dogs, and the results were compared with the gastric absorption characteristics reported for these drugs in man. Both compounds are highly lipid soluble (thiopental is about 20 times as lipid soluble as pentobarbital), weakly acidic and similar in structure. Thiopental and pentobarbital each appeared in the blood of all three species within 15 min. Thiopental reached a maximum blood level in the rat (2.25 μg/ml), dog (3.8 μg/ml) and man (3.3 μg/ml) within 30 min, after which the blood level in man and dog steadily declined. Pentobarbital reached a maximum blood level in the rat (2.2 μg/ml) within 15 min and in the dog within 60 min. In contrast, the concentration of pentobarbital in the blood of man steadily increased throughout the entire 120-min observation period (from 0.4 μg/ml at 15 min to 2.8 μg/ml at 120 min). Pentobarbital is more slowly absorbed through the gastric mucosa of man than through that of the rat and dog, while the gastric absorption patterns for thiopental are similar in all three species. These data indicate that the partition coefficient, rather than the water solubility of the substances tested is the most reliable indicator of the degree to which they will penetrate the gastric mucosa.

33

ABSORPTION OF GLYCINE AND GLYCINE PEPTIDES FROM THE SMALL INTESTINE OF THE RAT. *(E.)* Matthews, D. M. (Westminster Med. Sch., London, England), I. L. Craft, D. M. Geddes, I. J. Wise and C. W. Hyde. *Clin Sci* 35(3):415-424, 1968.

The relative rates of absorption of glycine, diglycine, triglycine and tetraglycine were investigated over a range of concentrations in tied loops of rat (Wistar) small intestine. The molar concentration/absorption rate curves for glycine, diglycine and triglycine over the range 67-333 mM/L were very similar, but the molar rate of glycine absorption was slightly more rapid than that of the peptides at low concentrations. The rate of absorption of tetraglycine was lower than that of the other compounds at the concentrations studied (67-133 mM/L); higher concentrations could not be used because of the limited solubility of this peptide. Lineweaver-Burk plots of these curves suggested that glycine may have a higher affinity for transport, and perhaps a lower maximum transport velocity than di- or triglycine. When a given quantity of glycine was introduced in the form of di- or triglycine, the rate of absorption, expressed as glycine, was found to be greater than when the same quantity was introduced as the free amino acid. Absorption of tetraglycine, expressed on this basis, was slower than that of the other peptides, but still more rapid than that of free glycine. Even at the higher concentrations used, the mean amount of free glycine appearing in the lumen corresponded to only about 1% of the total peptide introduced and to less than 5% of the peptide absorbed. These findings are incompatible with the hypothesis of hydrolysis of peptides within the free fluid of the intestinal lumen. Glycine, diglycine and triglycine may share a rate-limiting step in transport which precedes hydrolysis.

34

EFFECT OF INSULIN DEFICIENCY ON THE TRANSPORT OF GLUCOSE BY RAT SMALL INTESTINE. *(E.)* Leese, H. J. (Dept. Biochem., Imperial Coll., London, England) and K. R. L. Mansford. *FEBS Letters* 2(3):193-194, 1969.

The effect of diabetes induced by streptozotocin (65 mg/kg body weight i.v. 1 week before the experiment) or by anti-insulin serum (1 ml i.v. 1 hr before the experiment) on glucose transport by rat small intestine was investigated in everted sacs of the upper and terminal ileum according to the method of Wilson and Wiseman (*J. Physiol.* 123:116, 1954). A final glucose concentration ratio (serosal/mucosal) greater than 1 is indicative of active transport in this method. Insulin deficiency increased the final glucose concentration ratio from a control level of 0.80 ± 0.04 to 1.24 ± 0.06 for streptozotocin diabetes and to 1.18 ± 0.08 for anti-insulin serum diabetes in the terminal ileum, and from 1.71 ± 0.04 to 2.08 ± 0.01 for streptozotocin diabetes and to 2.22 ± 0.07 for anti-insulin serum diabetes in the upper ileum. Insulin at high concentrations (100 mU/ml) in the incubating media failed to restore glucose transport to normal. This effect was especially marked in the incubating media failed to restore glucose transport to normal. This effect was especially marked in the terminal ileum with insulin deficiency induced by anti-insulin serum. These data indicate that experimental insulin deficiency stimulates the absorption of glucose by rat small intestine *in vitro*.

35

DIFFUSION OF BROMSULPHOPHTHALEIN THROUGH RABBIT GALLBLADDER. *(E.)* Kruger, S. (Tulane U. Med. Sch., New Orleans, La.) and C. Cabrera-Gil. *Arch Int Pharmacodyn* 171(1):128-135, 1968.

Studies on the rate of diffusion of a BSP solution (2 mg/ml) through an isolated rabbit gallbladder showed that the movement of BSP across the gallbladder membrane (corrected for tissue adsorption) is proportional to the concentration difference, indicating passive diffusion. Addition of norepinephrine to the circumambient fluid at the dose level used (not stated) had no significant effect on the diffusion rate of the dye, while ephedrine decreased permeability. Epinephrine showed a nonlinear dose-dependent effect: decrease of permeability at low ($<10^{-7}$ M) concentrations, a maximum permeability greater than control at about 10^{-7} M, and a renewed decrease of permeability at high concentrations. Hyaluronidase and cyanide (at 2×10^{-4}-5×10^{-7}) increased permeability. Mersalyl was without effect, suggesting that sulfhydryl groups are not involved in the regulation of the permeability of the gallbladder membrane. Stretching the tissue by adding increased volumes of BSP solution to the gallbladder increased the rate of diffusion. These data suggest that diffusion may be regulated by several independently variable factors.

36

MEDIUM CHAIN TRIGLYCERIDES: THEIR ABSORPTION, METABOLISM AND CLINICAL APPLICATIONS. *(E.)* Holt. P. R. (St. Luke's Hosp. Ctr., New York City). Pp. 277-298 in *Progress in Gastroenterology.*

Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

37 THE DISTRIBUTION VOLUME OF IRON DURING ITS GASTROINTESTINAL ABSORPTION IN HEALTHY SUBJECTS. *(Cz.)* Brodan, V. (Inst. Study Human Nutrit., Prague, Czechoslovakia), E. Kuhn, M. Brodanová and J. Válek. *Cesk Gastroent Vyz* 22(5):300-305, 1968.

38 CAN BAKER'S YEAST PENETRATE THE INTESTINAL WALL? AN EXPERIMENTAL CONTRIBUTION TO THE QUESTION OF THE PERSORPTION OF LIVING YEAST. *(Ger.)* Korte, C. (Dermatol. Clin., U. Hamburg-Eppendorf, Germany), R. Brune, P. Schmidt and H. Rieth. *Mykosen* 11(12):919-922, 1968.

39 ROLE OF THE JEJUNUM IN OSMOREGULATION OF SOLUTIONS WITH DIFFERENT OSMOTIC PRESSURES. *(Fr.)* Ardisson, J. L. (Fac. Med. Pharm., Marseille, France) and J. Catier. *Arch Sci Physiol (Paris)* 22(4):485-502, 1968.

40 EFFECT OF AGE ON INTESTINAL ABSORPTION: IMPLICATIONS FOR DRUG ABSORPTION IN THE ELDERLY. *(E.)* Bender, A. D. (Smith Kline & French Lab., Philadelphia, Pa.). *J Amer Geriat Soc* 16(12):1331-1339, 1968.

41 COMPOSITION OF HUMAN CHYLE CHYLOMICRONS FOLLOWING SINGLE FAT FEEDINGS. *(E.)* Schlierf, C. (Akron City Hosp., Ohio), W. H. Falor, P. D. Wood, Y. Lee and L. W. Kinsell. *Amer J Clin Nutr* 22(1):79-86, 1969.

42 ABSORPTION AND EXCRETION OF DRUGS. XXXVI. EFFECT OF Ca^{2+} ON THE ABSORPTION OF TETRACYCLINE FROM THE SMALL INTESTINE. *(E.)* Kakemi, K. (Fac. Pharm. Sci., Kyoto U., Japan), H. Sezaki, H. Ogata and T. Nadai. *Chem Pharm Bull* 16(11): 2200-2205, 1968.

43 ABSORPTION AND EXCRETION OF DRUGS. XXXVII. EFFECT OF Ca^{2+} ON THE ABSORPTION OF TETRACYCLINE FROM THE SMALL INTESTINE. *(E.)* Kakemi, K. (Fac. Pharm. Sci., Kyoto U., Japan), H. Sezaki, M. Hayashi and T. Nadai. *Chem Pharm Bull* 16(11): 2206-2212, 1968.

44 DECREASE OF BASAL IRON TRANSFER FROM THE RESERVES INTO THE PLASMA DURING IRON ABSORPTION IN THE DIGESTIVE TRACT. *(Cz.)* Brodan, V. (Res. Inst. Human Nutrit., Prague, Czechoslovakia), M. Brodanová, J. Válek, I. Skála and V. Kordač. *Česk Gastroent Vyz* 22(6):361-366, 1968.

See also: 17,88,157,220,466,532

MOTILITY

5

NATURE OF THE INTESTINAL SLOW-WAVE FREQUENCY GRADIENT. *(E.)* Diamant, N. E. Upstate Med. Ctr., Syracuse, N. Y.) and A. Bortoff. *Amer* *Physiol* 216(2):301-307, 1969.

n 60 cats, 11 dogs, and 3 rhesus monkeys, small-intestinal nonophasic slow waves were recorded both *in situ* and *in vitro* vith flexible suction electrodes as previously described. In ntact segments, the frequency of slow waves decreased borally in stepwise fashion, with variable lengths of intestine aving the same frequency. Each frequency plateau was inariably separated from the next by an area of waxing and vaning, the pattern of which could be reproduced by crossing he input leads from the electrodes placed on the 2 adjacent lateaus. The lengths of the plateaus, and consequently the ositions of waxing and waning, were not constant. When he intestine was cut into small segments the slow-wave freuency of each consecutive segment decreased aborally in near fashion. These phenomena are explained on the asumption that intestinal smooth muscle can be regarded elecrically as a series of loosely coupled oscillators having sucessively decreasing intrinsic frequencies. In a frequency plaeau, individual oscillators are driven by the oscillator having he highest intrinsic frequency. At the end of the plateau, ither the coupling between oscillators is inadequate or the requency of the driving oscillator is too high for the next scillator to follow. The latter then assumes the role of the acemaker for the next frequency plateau. Waxing and waning ppears to be an interference phenomenon resulting from the ifference in slow-wave frequencies of adjacent cell populations.

6

GASTRIC INTEROCEPTIVE EFFECTS ON THE MOTOR ACTIVITY OF THE LARGE INTESTINE. *Rus.)* Vorob'ieva, N. M. (Sci.-Res. Inst. Nutrit., Kiev, USSR). *iziol Zh SSSR Sechenov* 54(9):1091-1093, 1968.

lotility measurements were made on the large intestine of 8 asting dogs with Basov gastric fistulas and Jakubowicz lateral olonic fistulas before, during, and after gastric stimulation. lechanical stimulation was produced by blowing up a balloon nside the stomach and chemical stimulation by introducing .5 liters of milk or 0.5 kg of meat and bread through the astric fistula. Type I and II contractions were produced by lowing up the balloon to 300-800 ml in 2-3 min. The reponse was more intense and the latent period shorter with rger volumes. These contractions lasted for 4-10 min, after hich the intestine returned to a state of rest. The introduction milk or a meat-bread mixture into the stomach produced ntractions in the large intestine which were mostly type II. hese findings indicate that both motor and chemical stimulaon of the stomach are important factors in regulating the otility of the large intestine.

INTESTINAL SLOW WAVES: DECREASE IN PROPAGATION VELOCITY ALONG UPPER MALL INTESTINE. *(E.)* McCoy, E. J. (U. Texas Med. ranch, Galveston) and R. D. Baker. *Amer J Dig Dis* 4(1): 13, 1969.

ectrical slow waves were recorded from platinum electrodes rmanently implanted on the antimesenteric surface of the g intestine at the duodenum below the ampulla of Vater, on the upper jejunum and on the ileum. Recordings were made 10-25 days following surgery in healthy, unanesthetized dogs trained to lie quietly on a table. A duodenal Biebl loop was prepared in 1 dog for the preliminary determination of wave sequence for a propagated slow wave. Reliable estimates of propagation velocity could not be obtained from ileal electrodes because of inconsistency and asynchrony of electrical activity in this region. The propagation velocity of the slow waves decreased caudally along the upper small intestine and was approximately a linear function of position. This decline, from about 15 cm/sec 24 cm above the ligament of Treitz to 3 cm/sec 24 cm below the ligament of Treitz, occurred along a portion of the upper small intestine in which the frequency of the slow waves remained essentially constant (about 18 cycles/min). The cause of this decline in velocity is unknown. Frequency and propagation velocity are apparently controlled by different mechanisms in this region of the intestine.

48

THE EFFECTS OF CHANGES IN BLOOD GLUCOSE LEVELS ON THE GASTRIC EMPTYING RATE. *(E.)* Aylett, P. (Westminster Med. Sch., London, England). *Amer J Dig Dis* 13(12):1035-1046, 1968.

The gastric emptying rate was determined in 16 normal, 31 peptic-ulcer and 18 diabetic subjects who were given water test meals of 750 ml according to Aylett's modification of Hunt's test meal procedure. Glucose meals of 20 and 50 g/liter also were given to the normal subjects and glucose meals of 10, 20, 50, 75 and 100 g/liter were given to 22 of the ulcer patients. No correlation was observed between the fasting blood glucose levels and gastric emptying for the entire group of 65 subjects, nor for the diabetic group analyzed separately. The rate of gastric emptying was inversely related to the rise in blood glucose level (and thus to the osmotic pressure exerted by glucose) during glucose meals in normal and peptic-ulcer subjects. The emptying rate was also inversely related to the concentration of glucose in the test meal. For peptic ulcer subjects, there was a low level of correlation between the quantity of glucose transferred to the duodenum in 20 min and the blood glucose level 10 min after the start of meals. These findings do not support the hypothesis that blood glucose controls gastric emptying by a feedback mechanism.

49

THE ACTION OF A CARMINATIVE ON THE LOWER ESOPHAGEAL SPHINCTER. *(E.)* Sigmund, C. J. (Downstate Med. Ctr., Brooklyn, N. Y.) and E. F. McNally.. *Gastroenterology* 56(1):13-18, 1969.

The effect of essence of peppermint on the lower esophageal sphincter was studied manometrically in 27 normal subjects. Intraluminal pressures were recorded from 3 open-tipped, water-filled catheters, with recording orifices 5 cm apart; the catheters were positioned so that the mid-recording orifice was at the lower esophageal sphincter. Through a 4th catheter, whose orifice was 1 cm distal to the orifice of the gastric catheter, 400-600 ml of air was introduced to serve as an indicator of gastroesophageal reflux (equalization of gastric and esophageal pressures); test solutions were also administered via this tube. Pressures were continuously recorded for 5 min following the introduction of air to ensure sphincter competence. After this control period, essence of peppermint (15 drops/30 cc of water) was introduced directly into the stomach of 24 subjects and the pressure responses were recorded for 20 min. Three subjects received essence of peppermint without prior air administration; 7 control subjects received 30 cc normal saline after air introduction. In all subjects, there was a 4-6 mm increase in gastric pressure after the air introduction. In 22 of the 24 subjects, reflux was demonstrated 60-420 sec (mean 169 sec) after peppermint instillation; the duration of sphincter relaxation varied from 12-42 sec (mean 27.8 sec). Elevation of esophageal pressure persisted until a peristaltic wave swept the refluxed air back into the stomach. In the same subjects, a significantly lower mean relaxation time of 7.9 sec was noted in response to a dry swallow. In the 3 subjects given peppermint without prior air administration, the pressure record was similar to the former group, but the reflux pattern was not as pronounced (mean time for response, 180 sec; mean duration of sphincter relaxation, 24 sec). In the 7 control subjects, there was no relaxation of the lower esophageal sphincter.

50 GASTRIC MOTOR-STIMULATING ACTIVITY OF GASTRIN TETRAPEPTIDE IN DOGS. *(E.)*

Jacoby, H. I. (Merck Inst. Ther. Res., West Point, Pa.) and C. H. Marshall. *Gastroenterology* 56(1):80-87, 1969.

The action of the C-terminal tetrapeptide of gastrin on gastrointestinal motor activity was investigated in anesthetized dogs with extraluminal force transducers located on the antrum, duodenum, ileum and colon. Gastrin tetrapeptide (T4) was found to stimulate only gastric antral motility, while carbachol and histamine stimulated all areas of the gastrointestinal tract. Gastrin pentapeptide and hog gastrin II also stimulated only gastric antral motility and were more potent than T4 on a mg basis. Both T4 and pentagastrin demonstrated a peak response, usually at 1 µg/kg i.v., with leveling of the dose-response curve at higher doses. When a series of doses of T4 was given at 5-min intervals in increasing order from 0.01 µg/kg to 10 µg/kg i.v., followed after a 2-hr rest period by the same dosage series given in decreasing order, the peak effect was found at 1 µg/kg with increasing doses and 10 µg/kg with decreasing doses. Similar results were obtained with pentagastrin. Doses of 0.1, 1, 10 or 100 µg/kg of T4 repeated 10 times at 5-min intervals revealed no significant change in the response with repeated injection of the lowest doses. At higher doses, there was a progressive reduction in the response. These data suggest that there is both acute tolerance to the motor effects and also a limit to the contractile response which may be produced by these gastrin peptides. With hog gastrin II, a much greater response could be elicited. Two anticholinergics (atropine and propantheline) were found to antagonize the motor stimulant effect of T4, but doses 5-10 times greater than those which block carbachol were required. Pyrilamine (an antihistaminic) and papaverine (a smooth-muscle relaxant) had only minimal activity against T4 at high doses. Chlorpromazine, which showed anticholinergic activity at 1 mg/kg, was inactive in doses up to 5 mg/kg. Morphine blocked gastrin T4, but not carbachol. None of the compounds tested was able to block the gastrin response completely. It is likely that gastrin does not act directly on smooth muscle, but on intramural nervous elements in the stomach.

51 GASTRIN, ACID, AND BILE. *(E.)*

Cole, G. J. (Queen's U. Belfast, Northern Ireland) and A. M. Connell. *Gut* 9(6):638-640, 1968.

Following pentagastrin stimulation (6 µg/kg) of 413 patients with a heterogenous group of digestive system diseases, the incidence of obvious bile in quarter-hour samples of gastric juice rose from 46% to 60%. Among 50 patients able to secrete 10-35 mEq/hr HCl and 25 patients with maximal acid responses of over 35 mEq/hr, samples of resting gastric juice contained small amounts of bilirubin (17.28 mg and 15.78 mg, resp.) at low concentrations (0.356 and 0.271 mg%, resp.), while 25 hypochlorhydric patients (<10 mEq/hr) had 4 times as much bilirubin (73.74 mg) at 8 times the concentration (2.466 mg%). Stimulation with pentagastrin resulted in trebling of the amount of bilirubin in the 75 patients able to secrete more than 10 mEq HCl/hr and considerable lowering of the concentration in the low secretors (1.775 mg%). These data indicate that low acid secretors are unable to keep bile out of the stomach at rest and that in persons able to secrete more than 10 mEq HCl/hr pentagastrin stimulation causes backflow of bile into the stomach. In 10 patients with normal liver function tests who were studied 10 days after cholecystectomy, there was a 41% increase in the amount of bile collected from the T tube and a 33% rise in the concentration of bilirubin following administration of pentagastrin (6 µg/kg). The mean size of the gallbladder was found to be unchanged in 9 patients 30 min after injection of pentagastrin. It appears that pentagastrin does not cause obvious contraction of the gallbladder and that the pentagastrin-induced rise in bilirubin concentration and quantity collected in the T tube cannot account for the backflow of bile into the stomach.

52 PRESENCE OF A NON-ADRENERGIC INHIBITORY SYSTEM IN THE HUMAN COLON.

(E.) Crema, A. (Dept. Pharmacol., U. Pisa, Italy), M. Del Tacca, G. M. Frigo and S. Lecchini. *Gut* 9(6):633-637, 1968.

Transmural stimulation with pulses of 1 msec duration at 1-10/sec for 30 sec caused longitudinal strips of healthy human colon to relax in 22% of the experiments and to contract in 78%; circular strips relaxed in 70% and contracted in 30%. Atropine (1 x 10^{-8} to 1 x 10^{-7} g/ml) reversed the contraction of both circular and longitudinal strips into relaxation. A large after contraction often followed cessation of stimulation. Epinephrine and norepinephrine (5 x 10^{-7} g/ml) produced prompt relaxation and cessation of all spontaneous movements in both type strips, but pretreatment with the α- and β-blocking agents dibenamine (1 x 10^{-6} g/ml) and propranolol (1 x 10^{-6} g/ml) completely blocked the response to catecholamines. The response to 5-hydroxytryptamine (1 x 10^{-6} to 1 x 10^{-5} g/ml) was variable, producing relaxation and contraction, resp., in 61% and 31% of longitudinal strips and in 75% and 25% of circular strips. The relaxation due to 5-hydroxytryptamine was completely blocked by methysergide maleate (1 x 10^{-6} g/ml), but was unaffected by the α- and β-blocking agents. Pretreatment with atropine (1 x 10^{-7} g/ml) reversed the contraction produced by 5-hydroxytryptamine to relaxation. The simultaneous addition of atropine (1 x 10^{-7} g/ml), dibenamine and propranolol (1 x 10^{-6} g/ml) and methysergide maleate (1 x 10^{-6} g/ml) at concentrations sufficient to block the response to acetylcholine, norepinephrine and 5-hydroxytryptamine failed to alter the relaxation caused by transmural stimulation. Tetrodotoxin (1 x 10^{-6} g/ml) abolished the relaxation produced by electrical stimulation, in both untreated and atropinized longitudinal and circular preparations, without abolishing the relaxation induced by 5-hydroxytryptamine. The sensitivity of the inhibitor response to tetrodoxin supports the involvement of nonadrenergic nervous elements in the transmural relaxation.

53 GALL BLADDER CONTRACTILITY BY CHOLECYSTOKININ CONCENTRATES IN ANIMALS SUBJECTED TO SURGICAL REMOVAL OF VARIOUS ENDOCRINE ORGANS.

(E.) Gershbein, L. L. (Northwest Inst. Med. Res., Chicago, Ill.) and R. W. Denton. *Arch Int Pharmacodyn* 171(1):174-178, 1968.

The effect of i.v. administered cholecystokinin concentrates (CCK) isolated from hog A-precipitate on gallbladder contractility was determined in adult dogs following extirpation of various endocrine organs. Cholecystography was performed and the extent of gallbladder evacuation was quantitated by use of planimetry after injection of standardized doses of CCK. In comparison with the cholecystographic data for 35 intact control animals (60, 80-150, and 200-240 U of CCK produced 33, 48 and 71% contraction of the gallbladder, resp.), 5 ovariectomized dogs (85% evacuation with 160 U CCK) and 3 bilaterally thyroidectomized dogs (100% evacuation with 140 U CCK) showed increased sensitivity to the CCK extracts. Five castrated dogs given 60 U CCK showed little change (35% evacuation) from the control response and 1 hypophysectomized dog demonstrated only 27% evacuation after 144 U CCK. Three depancreatized dogs given 80 U CCK had 14% evacuation and 1 given 240 U showed only 20% evacuation, suggesting a lower sensitivity to CCK than in controls. Assay of the operated animals for secretion and cholecystokinin activities in known concentrates gave results that were in good agreement. The distribution of CCK and secretin in concentrates of upper intestinal strips from these dogs was similar to that from intact dogs.

54 INHIBITION OF GASTRIC MOTILITY IN CAT BY ACETYLCHOLINE AND GANGLION STIMULANT DRUGS.

(E.) Shin, P. C. (Chonnam U. Med. Sch., Kwangju, Korea), E. S. Kim, H. S. Kim and Y. I. Kim. *Arch Int Pharmacodyn* 171(1):93-101, 1968.

The effects of i.v. acetylcholine (Ac), 4-(m-chlorophenylcarbamoyloxy)-2-butynyl-trimethylammonium chloride (McN-A-343), N-benzyl-3-pyrrolidyl acetate methobromide (AHR-602), various sympathomimetic amines, atropine, hexamethonium, phentolamine, bretylium, 4'-(2-isopropylamino-1-hydroxyethyl)-methanesulfonanilide (MJ-1999), dimethylpnenylpiperazinium (DMPP) and i.p. reserpine on gastric motility were studied in chloralose anesthetized cats (30-40 mg/kg i.v., sometimes supplemented with 3 mg/kg pentobarbital sodium i.v.). Intragastric pressure fluctuations were recorded on a smoked drum. Ac (10-20 μg/kg), McN-A-343 (20 μg/kg), AHR-602 (0.3 mg/kg), DMPP (10 μg/kg), norepinephrine, epinephrine and isoproterenol (each at 5 μg/kg) all produced inhibition of gastric motility (decrease in tone and simultaneous abolition or marked diminution of amplitude of contraction waves). Increasing the dose of Ac, McN-A-343, DMPP and AHR-602 produced a more prominent inhibition. Gastric motility in spinal cats was also inhibited by Ac. Atropine (20 μg/kg) blocked the inhibitory response to Ac (10-20 μg/kg), McN-A-343 (20-50 μg/kg) and AHR-602 (0.3-1.0 mg/kg), but not to DMPP (10 μg/kg) or to the sympathomimetic amines. Hexamethonium (0.3-0.5 mg/kg) blocked the inhibitory response to DMPP, but not to Ac, McN-A-343, AHR-602 and the sympanthomimetic amines. At larger doses (1 mg/kg), hexamethonium markedly depressed gastric motility, abolished the DMPP effect, and diminished the response to Ac, but had no effect on the response to McN-A-343 and AHR-602. Alpha-adrenergic blockade with phentolamine (5-8 mg/kg) blocked the inhibitory response to norepinephrine, and abolished or markedly reduced the response to Ac, DMPP and McN-A-343, but not to isoproterenol. Beta-adrenergic blockade with 10-20 mg/kg of MJ-1999 blocked the effect of isoproterenol without significantly affecting the response to the other agents tested. In reserpinized cats (2.5 mg/kg i.p. for 2 days prior to the experiment), Ac produced an incomplete relaxation of motor response, and McN-A-343 and AHR-602 failed to show a distinct inhibitory response. The inhibitory response to norepinephrine appeared to be potentiated for about 1 hr after i.v. injection of bretylium, while the responses to Ac, McN-A-343, AHR-602 and DMPP remained unchanged for 6 hr. These findings suggest that the inhibition of gastric motility by Ac, McN-A-343 and AHR-602 is due to catecholamine release resulting from stimulation of "atropine-sensitive sites" or "muscarinic receptors" in the sympathetic ganglia.

55 OESOPHAGEAL ANAPHYLAXIS AND PHARMACOLOGICAL ACTIONS.

(E.) Califano, G. (Inst. Surg. Path., U. Naples, Italy) and U. Scapagnini. *Pharmacology* 1(4):218-228, 1968.

In vitro studies on 5-cm strips of sensitized guinea pig esophagus indicated that the addition of antigen (1 ml of 1% ovalbumin) to the medium bathing empty of Tyrode-filled lumens produced Dale-type contractions in 65% and 45% of the preparations, resp. Strong and lively (in 20% of the preparations) or slow and late (in 30%) phasic activity appeared during the contraction phase in the case of empty lumens and less intense motility occurred with filled lumens. The introduction of ovalbumin into empty esophageal lumens always resulted in contraction, which was usually characterized by a late onset and a moderate phasic activity. Intraluminal administration of antigen into filled lumens always caused a strong motor response, which was rhythmic in about 75% of the cases. Intraluminal adminstration of 1-10 μg of serotonin or bradykinin was nearly always ineffective in nonsensitized guinea pig preparations, while histamine (10 μg) and histidine decarboxylase (100 μg) produced contraction without successive motility, or with delayed, limited motility. Prior administration of mepyramine (1×10^{-8} to 1×10^{-7} M) in the case of filled lumens reduced but did not abolish the response to intra- or extraluminally administered antigen. In contrast, tritoqualine, injected *in vivo* (50 mg/kg i.p.) 30 min before excising the esophagus almost completely blocked the contraction and subsequent motility induced by ovalbumin. The *in vitro* introduction of tritoqualine into the esophageal lumen was less effective in preventing the motor response. The possibility cannot be ignored that endogenous histamine, liberated by histidine decarboxylase when the anaphylactic reaction occurs, causes the liberation of other substances capable of acting on the esophageal myenteric plexus. These data indicate that these substances are probably not bradykinin or serotonin, but may be compounds related to Substance P.

56 EFFECT OF SMOOTH MUSCLE STIMULATING SUBSTANCES ON DIFFERENT SEGMENTS OF THE GUINEA PIG ILEUM.

(E.) Eichbaum, F. W. (Fac. Med., U. São Paulo, Brazil) and Z. Bruno. *Pharmacology* 1(4):241-245, 1968.

MOTILITY

Various smooth-muscle stimulating substances (0.1-0.5 μg histamine, 0.1-0.5 μg acetylcholine, 30-50 μg pilocarpine, 3-5 μg nicotine, and 250-1000 μg barium) elicited a quantitatively different response (varying height of contraction) from 4 arbitrarily divided 1-cm segments of the terminal ileum of the guinea pig. The most distal segment, close to the ileocecal valve, usually showed the least sensitivity and sometimes failed to contract even after exposure to high doses of the test drug, especially histamine. The spontaneous movements of this section of the intestine were very weak or totally absent. The sensitivity of the ileum to the various drugs generally increased with distance from the ileocecal valve upwards. Spontaneous motility and sensitivity were greatest in the most cephalad of the 4 segments. The significance of these findings for the technique of biological assay of smooth-muscle stimulating substances is discussed.

57 **DIFFERENTIATION OF VARIOUS TYPES OF CHOLINERGIC AND OTHER SPASMOGENIC ACTIONS ON THE ISOLATED GUINEA-PIG ILEUM.** *(E.)* Henderson, P. T. (Dept. Pharmacol., U. Nijmegen, Netherlands), E. J. Ariens and A. M. Simonis. *Europ J Pharmacol* 4(1): 62-70, 1968.

58 **ON THE INABILITY TO PRODUCE SUPERSENSITIVITY TO CATECHOLAMINES IN INTESTINAL SMOOTH MUSCLE.** *(E.)* Govier, W. C. (U. Texas Southwest Med Sch., Dallas), M. F. Sugrue and P. A. Shore. *J Pharmacol Exp Ther* 165(1): 71-77, 1969.

59 **COMPARISON OF OBJECTIVE MEASUREMENT OF ANAL SPHINCTER STRENGTH WITH ANAL SPHINCTER PRESSURES AND LEVATOR ANI FUNCTION** *(E.)* Diamant, N. E. (Boston U. Med Ctr., Mass.) and L. D. Harris. *Gastroenterology* 56(1): 110–116, 1969.

60 **THE EFFECT OF DIPHENOXYLATE ON THE PERISTALTIC REFLEX OF THE GUINEA-PIG ILEUM** *(E.)* VanNueten, J.M. (Janssen Pharm., Beerse, Belgium). *Arch Int Pharmacodyn* 171(1): 243-245, 1968.

See also: 84,179,181,416

SECRETION AND METABOLISM

61 **METABOLISM OF CANINE SMALL INTESTINE VASCULARLY PERFUSED *IN VITRO*. *(E.)***
Hohenleitner, F. J. (Philadelphia Gen. Hosp., Pa.) and J. R. Senior. *J Appl Physiol* 26(1):119-128, 1969.

In vitro studies of O_2 and glucose consumption and lactate and CO_2 production were made in canine small bowel perfused via the superior mesenteric artery. The entire jejunoileal portion of the bowel was perfused for up to 5 hr with a modified Ringer-Locke solution containing 6% dextran alone or with added sheep erythrocytes. Under hyperglycemic or normoglycemic conditions, glucose uptake from the perfusate was 0.31-1.63 mM/100 g/hr and lactate output was 0.17-3.73 mM/100 g/hr. Intestinal O_2 consumption and CO_2 output were a function of perfusate flow. Phenoxybenzamine administration increased flow. Atropine and cyproheptadine, when administered together, greatly reduced motility and decreased both O_2 consumption and CO_2 output. Under conditions of minimal motility the intestine could be perfused without erythrocytes, with similar O_2 consumption, CO_2 output, and lactate output. This type of preparation may be useful in studying the absorptive and metabolic capacity of the small intestine free from the influence of other organs.

62 **AMYLASE AND LIPASE SECRETION IN THE HEPATIC AND INTESTINAL LYMPH: I. STUDIES INVOLVING ACUTE PANCREATECTOMY. *(E.)***
Singh, H. (Hahnemann Med. Coll., Philadelphia, Pa.), J. Pepin, H. E. Appert, F. W. Pairent and J. M. Howard. *Ann Surg* 169(2):233-239, 1969.

The effects of secretin and pancreozymin stimulation on the amylase and lipase concentrations in the serum and the hepatic and intestinal lymph were studied in a series of mongrel dogs before and immediately after pancreatectomy. Lymph samples were collected by cannulation of the hepatic and small intestinal lymphatics. After collection of control samples, secretin (115 Boots units) or secretin with pancreozymin (95 Boots units), diluted in 200 ml normal saline, was administered i.v. over a 30-min period. Prior to pancreatectomy, the serum and lymph enzymes increased above their control values following administration of secretin and pancreozymin. After pancreatectomy, the effect of secretin and pancreozymin was abolished. Prior to pancreatectomy, the hepatic and intestinal lymph amylase and lipase levels were higher than those of the serum. After pancreatectomy, the enzyme levels of the lymph were the same as those of the serum. Therefore, the liver and small intestine do not contribute to the serum amylase and lipase levels via the lymphatic system in the dog.

63 **NUCLEIC ACID METABOLISM IN THE GASTROINTESTINAL TRACT OF THE MOUSE DURING FASTING AND RESTRAINT-STRESS. *(E.)***
Imondi, A. R. (Cornell U. Med. Coll., New York, N. Y.), M. E. Balis and M. Lipkin. *Exp Molec Path* 9(3):339-348, 1968.

RNA and DNA metabolism in the gastrointestinal tract of male CFW mice subjected to stress was investigated to determine whether alterations in nucleic acid metabolism play a role in the development of stress-induced gastric erosions. The uptake of thymidine-methyl-^{3}H and uridine-5-^{3}H (20 μC and 10 μC i.p., resp.) by gastrointestinal tissue was measured after 16 and 40 hr of fasting and restraint. Fasting had little effect on DNA or RNA metabolism in the gastrointestinal tract except for increases in the uptake or uridine in the small intestine (thought to represent changes in uridine pool size). Restraint caused a reduction in DNA synthesis along the entire gastrointestinal tract and affected RNA metabolism in the stomach but not in the small intestine or colon. The changes in the stomach included early loss of total RNA followed by a decrease in the uptake of uridine-5-^{3}H. The latter appeared to coincide with the occurrence of gastric erosions.

64 **BIOSYNTHESIS OF PURINE NUCLEOTIDES IN CHICK LIVER AND INTESTINE. *(E.)***
Foung, A. (Dept. Biochem., U. California, Riverside) and A. W. Norman. *Biochim Biophys Acta* 174(1):405-407, 1969.

In order to determine whether there are basic differences in the manner in which the purine moieties of ribonucleotides and deoxyribonucleotides are formed, the relative contribution of *de novo* synthesis and the pathway utilizing preformed purine bases was determined in chick liver and intestine using ^{14}C-glycine and ^{3}H-adenine. A difference in the ^{14}C/^{3}H ratio between RNA and DNA purines would indicate that the patterns of their synthesis differ. Twelve hr after the intracardial injection of 2 μC of carrier-free ^{14}C-glycine and 25 μC of carrier-free ^{3}H-adenine, the livers and intestines of 8 chicks were processed for analysis of ^{14}C and ^{3}H in the purine bases. The ^{14}C/^{3}H ratios obtained suggested that the *de novo* pathway is the preferred route for nucleotide synthesis. Only small differences in the ^{14}C/^{3}H ratios were found between the RNA and DNA purines, but these differences attained statistical significance in the case of the intestine, indicating that all the purine bases did not originate from the same source.

65 **BIOCHEMICAL IDENTIFICATION AND CHARACTERIZATION OF THE MULTIPLE FORMS OF ALKALINE PHOSPHATASE IN THE DEVELOPING DUODENUM OF THE MOUSE. *(E.)*** Etzler, M. E. (Dept. Biol., Washington U., St. Louis, Mo.) and F. Moog. *Develop Biol* 18(5):515-535, 1968.

DEAE-cellulose column chromatography and horizontal starch gel electrophoresis of butanol-extracted duodenal homogenates from newborn, 11-day, 15-day, 20-day, and adult Swiss mice showed that the alkaline phosphatase isozymes of the mouse duodenum can be divided into 2 classes. The first class, which comprises most of the phosphatase activity of the newborn and 11-day extracts, consists of isozymes having relatively fast electrophoretic mobilities. The sodium acetate eluates of this peak all had PhP/bGP ratios (hydrolysis of phenylphosphate relative to that of β-glycerophosphate) less than 1.0. The presence of 3 distinct bands in the starch-gel electrophoretogram suggests that this group may contain 3 forms of duodenal phosphatase that cannot be separated under the chromatographic conditions used. Similar chromatographic and electrophoretic patterns are obtained with 15- and 20-day extracts, except that the eluates have PhP/bGP ratios which rise to 2.0-2.5 by 20 days. A second class of phosphatase isozymes, with PhP/bGP ratios above 2 (some as high as 10), begins to superimpose on the initial pattern by age 15-days. The members of this class include high-ratio forms which demonstrate slow mobility in starch-gel electrophoresis. Activities differing in PhP/bGP ratio are partially separable by column chromatography and zone electrophoresis, indicating that at least 4 forms of phosphatase are included in this class. However, in spite of additional measures to separate these isozymes, they could not be resolved into distinct components, but rather showed a continuous gradation of PhP/bGP ratios and mobilities. These observations suggest that a large number of phosphatase isozymes are present in duodenal extracts at 20 days and older. The second class of isozymes may develop by the progressive formation of isozymes with increasing PhP/bGP ratios as the epithelial cells mature and migrate toward the villus tip.

66 **THE EFFECT OF HOG GASTRIN AND ICI-50123 ON INTESTINAL SEROTONIN IN THE SPRAGUE-DAWLEY RAT.** *(E.)* Thompson, J. H. (UCLA Sch. Med., Los Angeles, Calif.). *Europ J Pharmacol* 3(4):306-309, 1968.

See also: 12,157,196

67

GASTRIN I. PENTAGASTRIN AND HISTAMINE IN THE FISTULA DOG. *(E.)*

Hirschowitz, B. I. (U. Alabama Med. Ctr., Birmingham). *Fed
Proc* 27(6):1318-1321, 1968.

By plotting the dose-response curve to separate infusions
(4-4.5 hr) of histamine, pentagastrin and gastrin I in trained
unanesthetized dogs with gastric cannulas and esophagostomies,
it was shown that the kinetics of response to all 3 are similar.
Gastric secretion of water and electrolytes is related to dose
in a log-sigmoid curve, from which it is possible to derive the
equation (S - T)/V = a (S - T) + b where S = dose of stim-
ulant, T = calculated threshold, and V = output. For Na,
T = O with all 3 stimuli. From this equation, V^{max} and
S_{50} (the dose giving 50% of the theoretical maximal output)
can be calculated. The V^{max} for histamine is 30-50% higher
han for the gastrins, while the S_{50} ratios in molar terms are
:123:400. Response declines with time to all 3 stimuli, de-
pite continued administration of the same dose, proving that
eparate-dose infusion studies are more accurate than dose-
esponse studies in which the dose is increased progressively
n the course of the same experiment. The stimulation of
epsin secretion by gastrin, especially pentagastrin, and the
ensitivity of pentagastrin stimulation to atropine inhibition
ndicates that there are significant differences between the
ctions of histamine and the gastrins. This suggests that
istamine cannot be the only means whereby gastrin produces
s effect on the stomach.

8

THREE COMPONENTS OF Cl^- FLUX ACROSS ISOLATED BULLFROG GASTRIC MUCOSA.

.) Forte, J. G.((Dept. Physiol., U. California, Berkeley).
mer J Physiol 216(1):167-174, 1969.

studies on ion transport *in vitro*, bullfrog gastric mucosa
as separated from the stomach muscle and suspended between
Lucite chambers. The bathing solutions which were im-
ediately placed into the chambers were continually aerated
d stirred with a gas phase of 5% CO_2-95% O_2. The flux
Cl^- from nutrient to secretory solution across the gastric
ucosa was operationally separated into 3 components: ac-
e secretion, a passive leak, and exchange diffusion. The
crement in flux on removal of Cl^- from the secretory solu-
on (isethionate replacement) was taken as an estimate of Cl^-
change diffusion. The metabolically dependent flux when
change diffusion was eliminated was taken as the active com-
nent. The passive leak of Cl^- was that remaining after elim-
ation of the active and exchange components. Conditions
ding to a decrease (anoxia) or increase (histamine) in the
tive component of the Cl^- flux produced a stoichiometric
ange in H^+ secretion. This suggests close electrical or bio-
emical coupling between H^+ and Cl^- transport. The rate
H^+ secretion was not affected by variations in the Cl^- con-
ntration on the secretory side; however, conditions of dim-
shed H^+ secretion resulted in a diminution of Cl^- exchange
fusion. Thus, H^+ secretion is independent of Cl^- exchange
fusion but the mode of Cl^- transport and exchange is greatly
luenced by metabolic events which control H^+ secretion.
lues for the passive leak of Cl^- were consistent with meas-
ments of mucosal conductance and they appear to obey
umptions implicit in the constant-field equation.

69

ACTION OF SOLUTIONS OF REDUCED OSMOTIC CONCENTRATION ON THE DOG GASTRIC MUCOSA. *(E.)*

Altamirano, M. (Fac. Med., Cent. U. Venezuela, Caracas). *Amer J Physiol* 216(1):25-32, 1969.

In anesthetized mongrel dogs, a piece of the greater curvature of the stomach was dissected, without disturbing its blood supply, mounted in a Lucite chamber with an airtight cover, and kept at constant temperature. The output of Na^+, K^+, Cl^-, HCO_3^-, protein and nonprotein nitrogen, and net water flow were measured. With the mucosa in contact with distilled water, the output of Na^+, K^+, and Cl^- was 34, 2, and 34 nEq/cm^2/min, resp. With urea, glucose, or sucrose added to the distilled water, the ionic output remained the same whether the net water flow was positive or negative, until the solute concentration was 0.5 M or less in the case of urea, 0.7 M for glucose, and greater than 0.8 M for sucrose. These concentrations caused a significant increase of the ion output in 50% of the animals. Even "isosmotic" solutions of the 3 solutes increased the output of protein nitrogen over the output found with distilled water. At higher concentrations, glucose enhanced the secretion of protein nitrogen more effectively than sucrose. These findings suggest that the "alkaline component of the gastric secretion" might not be a distinct secretion. Na^+, Cl^-, and HCO_3^- diffuse towards the gastric cavity without a net flow of water if the gastric contents are isosmotic to plasma.

70

ACTION OF CONCENTRATED SOLUTIONS OF NONELECTROLYTES ON THE DOG GASTRIC MUCOSA. *(E.)*

Altamirano, M. (Fac. Med., Cent. U. Venezuela, Caracas). *Amer J Physiol* 216(1):33-40, 1969.

As in the previous study, a piece of the greater curvature of the stomach was dissected from anesthetized dogs without disturbing its blood supply, mounted in an airtight Lucite chamber, and kept at constant temperature. Solutions (1.2 or 2 M) of urea, glucose, and sucrose in contact with the gastric mucosa produced a remarkable and reversible increase of the output of Na^+, Cl^-, K^+, HCO_3^-, and protein nitrogen. With increasing flow, ions tended to diffuse at rates proportional to their respective plasma concentrations. The ionic transport increased relatively more than the net flow of water, resulting in the transport of a fluid hypertonic to plasma. This provides evidence that a flow of extracellular fluid takes place across the epithelium with 2 M solutions. Urea and glucose increased the flow of ions more effectively than sucrose. Sucrose produced the smallest flow of protein nitrogen. It is suggested that the output of ions increases, in part, because the permeability coefficients of the membrane increase. The properties of the gastric membrane undergo reversible change in contact with hyperosmotic solutions.

71

EFFECT OF SECRETIN ON GASTRIC ACID AND PEPSIN SECRETION IN RESPONSE TO VARIOUS STIMULI. *(E.)*

Nakajima, S. (Creighton U. Sch. Med., Omaha, Neb.), M. Nakamura and D. F. Magee. *Amer J Physiol* 216(1):87-91, 1969.

The effect of highly purified secretin on gastric acid and pepsin secretion in response to histamine, methacholine, gastrin pentapeptide, antral irrigation with acetylcholine solutions, and feeding was investigated in 5 healthy adult mongrel dogs fitted with Heidenhain fundic pouches and denervated antral pouches. All drugs used were given i.v. except for acetylcholine. In the experiments with histamine, methacholine, and gastrin pentapeptide, dose-response curves for acid and pepsin output from the Heidenhain pouches were obtained and then repeated with a constant background of secretin in a dose of 0.5 clinical U/min. The effect of high doses (1.5 and 3 U/min) of secretin superimposed on background stimulation by histamine on Heidenhain-pouch secretion was also studied. In the antral irrigation and feeding experiments, secretin in a dose of 0.5 U/min was administered continuously for 40 min after plateau secretion had been attained. Secretin depressed the gastric acid response to small doses of histamine, to methacholine, to gastrin pentapeptide, to the antral phase, and to the intestinal phase of gastric secretion. The acid response to high doses of histamine was not significantly altered by secretin. Methacholine showed the most potent pepsigogic action. Combinations of histamine or gastrin pentapeptide with secretin produced higher pepsin outputs than the same dose of histamine or pentapeptide alone. With increasing doses of histamine, pepsin stimulation by secretin increased, unlike the constant level of stimulation seen with pentapeptide. These findings suggest the possibility that secretin may be a physiological stimulant of pepsin secretion.

72 **THE EFFECT OF HYPOXIA AND HYPERCAPNIA OF BASAL ACID SECRETION FROM INNERVATED GASTRIC POUCHES IN DOGS.** *(E.)* Passi, R. B. (Ohio State U. Coll. Med., Columbus) and J. S. Vasko. *Surg Gynec Obstet* 128(2):322-326, 1969.

In an effort to explain the increased incidence of peptic ulcers in patients with pulmonary emphysema, the effects of hypercapnia (5% CO_2 and 95% air), hypoxia (10% O_2 and 90% N_2), or both (10% CO_2, 10% O_2 and 80% N_2) on basal acid secretion were studied in 7 dogs with Pavlov pouches. During 1 hr under hypoxic conditions, basal gastric acid secretion decreased from 0.1 to 0.04 mEq/hr. Under conditions of hypercapnia and hypoxia, gastric acid secretion also decreased (from 0.51 to 0.18 mEq/hr), even though there was mild respiratory acidosis, suggesting that gastric secretion is not significantly affected by arterial pH. Hypercapnia alone had no effect at all on basal gastric secretion. It appears that factors other than hypercapnia are responsible for the gastric acid hypersecretion which is observed in response to histamine or food stimulation in patients with pulmonary emphysema. Anxiety and neurogenic stimuli, as well as high endogenous levels of histamine, may also be significant factors in such conditions. The harmful effect of hypoxia on the gastroduodenal mucosa may be another factor in the genesis of peptic ulcers in these patients.

73 **THE SECRETION OF GASTRIC JUICE IN DOGS AFTER LARGE DOSES OF ACTH AND PREDNISOLONE.** *(Rus.)* Genes, S. G. (Inst. Endocrinol. Hormone Chem., Khar'kov, USSR) and N. G. Lesnoi. *Fiziol Zh SSSR Sechenov* 54(10):1223-1230, 1968.

A study was made of the effects of histamine, insulin, prednisolone, and ACTH on the volume, free HCl, total acidity, and digestive activity of gastric juice produced by feeding 4 dogs with 100 g of beef tendons. Animals were given 60 or 120 units of ACTH i.m. or 10 mg prednisolone p.o. for 10-30 days. Long-term administration of ACTH increased gastric secretion in 1 of 10 experiments, decreased it in 5, and produced no change in 4. Large increases occurred in free and bound urinary 17-hydroxycorticosteroids. Prednisolone increased gastric secretion significantly in 7 of 10 cases. Free HCl and total acidity decreased to different extents in different animals, and digestive activity decreased in 3 cases. Administration of 0.5 mg histamine s.c. to animals receiving ACTH significantly increased gastric secretion in 14 of 18 experiments. Administration of the same dose of histamine to animals receiving prednisolone increased gastric secretion in 10 of 12 experiments. The latent period was reduced only with ACTH. No significant changes in free HCl or total acidity occurred with either prednisolone or ACTH. Administration of 0.5 U/kg insulin to animals receiving prednisolone reduced gastric secretion in 10 of 12 experiments. No significant changes occurred in the latent period, free HCl, total acidity, or digestive activity. Reflex mechanical stimulation of the stomach glands increased gastric secretion in 4 of 6 experiments with animals receiving prednisolone and reduced gastric secretion in 5 of 10 experiments with animals receiving ACTH. These findings show that corticosteroids do not consistently increase gastric secretion.

74 **THE EFFECT OF RESECTING THE SMALL INTESTINE AT DIFFERENT LEVELS ON THE SECRETORY FUNCTION OF THE STOMACH.** *(Rus.)*

Isakhanov, G. I. (Inst. Norm. Path. Physiol., Acad. Med. Sci. USSR, Moscow). *Fiziol Zh SSSR Sechenov* 54(9):1094-1101, 1968.

The effects of 1) duodenal resection, 10-12 cm below the entry of the pancreatic duct, 2) jejunal resection, 10-12 cm below the suspensory muscle of the duodenum, and 3) ileal resection, 50-60 cm above the ileocecal junction, on gastric secretion were studied in 13 dogs with gastric fistulas; each surgical procedure was followed by immediate end-to-end reanastomosis. Gastric secretion was stimulated by feeding 125 g of meat, giving 300 ml of a 20% hematogen solution (defibrinated cattle blood and glycerol) p.o., sham feeding of meat for 3 min, and 0.06-0.01 carbachol or 1-1.5 mg histamine s.c. After duodenal or jejunal resection increases occurred in gastric secretion, free HCl, total acidity, and pepsin concentrations with all types of stimulation. In contrast, ileal resection reduced gastric secretion, free HCl, and total acidity when gastric secretion was stimulated by feeding meat or administering carbachol, but had no effect on histamine stimulation of gastric secretion. In 2 of 3 dogs, ileal resection produced no changes in gastric secretion, free HCl, total acidity, or pepsin concentrations when sham feeding was used to stimulate gastric secretion. In the 3rd dog, gastric secretion decreased during the first 2-2.5 months after surgery, returning to normal at 3-4 months. A significant increase occurred in pepsin concentrations. These findings suggest that intestinal resections damage intramural nerves in the intestinal walls which control gastric secretion.

75 **ADENOSINE MONOPHOSPHATES AND PHOSPHORYLASE ACTIVITY IN FROG STOMACHS.** *(E.)* Nigon, K. (U. California Sch. Med., San Francisco) and J. B. Harris. *Amer J Physiol* 215(6):1299-1304, 1968.

The effect of 3',5'-phosphate (cyclic AMP) on phosphorylase activity in frog gastric mucosa was studied in specimens obtained from fasted *Rana pipiens* and *Rana catesbeiana*. Phosphorylase activity in the mucosa of *R. pipiens* was found to be low and to decrease further during incubation; the addition of cyclic AMP retarded this decline in activity. Phosphorylase activity was 2.3 times as high in the mucosa of *R. catesbeiana* than in that of *R. pipiens*. This activity also increased during incubation and was not affected by the addition of cyclic AMP. It is suggested that the state of the phosphorylase or other target enzymes as well as differences in permeability may affect the acid secretory response to exogenous cyclic AMP in various species.

76 ADENOSINE MONOPHOSPHATES AND GLYCOGENOLYSIS IN FROG GASTRIC MUCOSA.

(E.) Alonso, D. (U. California Sch. Med., San Francisco), O. H. Park and J. B. Harris. *Amer J Physiol* 215(6): 1305-1309, 1968.

The effect of adenosine 3',5'-phosphate (cyclic AMP) on the glycogen content and lactic acid production in frog gastric mucosa was studied in specimens obtained from fasted *Rana pipiens.* Cyclic AMP increased glycogenolysis in mucosa incubated in chloride solutions and to a lesser extent in glucuronate solutions. Lactic acid production was increased under aerobic but not nder anaerobic conditions. Only one half of the increase in oxygen consumption could be accounted for by the increase n glycogen utilization. It is suggested either that cyclic AMP nay act to stimulate lipolysis and glycolysis separately, or that he increased glycogenolysis and lipolysis are secondary to ef-ects of cyclic AMP on the oxidative phase of metabolism and he secretion process. When 5'-AMP was tested, it was found o differ from cyclic AMP in every response measured.

7 GASTRIC ACID SECRETORY RESPONSES TO SOME PURIFIED FOODS AND TO ADDITIONS OF SUCROSE OR OLIVE OIL.

(E.) Kotrba, C. (Mayo Clin., ochester, Minn.) and C. F. Code. *Amer J Dig Dis* 14(1):1-8, 969.

quicaloric and equivolumetric meals of lean beef, purified roteins (lactalbumin, gluten, milk casein and egg albumin), live oil and sucrose were fed by stomach tube to 5 healthy sted female dogs with vagally innervated mucosal septal ouches, and the total output of acid in response to each of ne meals was determined. The total outputs of acid stimulated y 100-calorie meals of the purified proteins (250 ml volume) ere frequently as great as the secretory response to the meat eals: lactalbumin, gluten, casein, and gelatin gave 92, 89, 86 nd 69% of the meat response, resp. Sucrose, methylcellulose nert control meal), olive oil and egg albumin stimulated the roduction of acid equivalent to 25, 31, 40 and 42% of that btained with meat. With the exception of egg albumin, the uantity of acid secreted in response to the ingestion of the st meals was directly related to their buffering capacity (meas-ed by the amount of HCl required to reduce the pH of each eal to 2.0). These findings do not support the existence of special gastric acid secretory factor in meat. To determine hether the addition of fat to a meat meal reduces the expected tal output of HCl, the effect of adding 100 calories or sucrose, ive oil, or meat to a meal of 100 calories of meat was studied 4 additional dogs with innervated pouches. The acid outputs were 85, 85 and 87% of outputs calculated by adding the separate 100-calorie outputs of the test meals.

78 RESPONSE OF RATS WITH CHRONIC GASTRIC FISTULAS TO SUBCUTANEOUS INJECTIONS OF HISTAMINE, ICI-50123, AND INSULIN.

(E.) Lee, Y. H. (UCLA Sch. Med., Los Angeles, Calif.) and J. H. Thompson. *Amer J Dig Dis* 14(1):14-29, 1969.

Gastric secretory volume, acid concentration, acid output and acid output per 100 g rat weight were studied as a function of time in 30 male Sprague-Dawley rats with chronic gastric fistulas following s.c. administration of histamine (5-80 mg/kg), crystalline zinc insulin (0.1-2.0 U/kg), and the synthetic gastrin-like pentapeptide ICI-50123 (50-600 μg/kg). In control animals given 0.85% normal saline s.c., gastric secretion remained constant throughout the collection period. A 20 mg/kg dose of histamine induced maximal gastric secretion with peak responses occurring 1 or 2 hr postinjection. Responses to insulin hypoglycemia were quite irregular, both as a function of dose and of time. Peak volume response occurred with 0.8 U/kg, acid output with 1.0 U/kg and acid output per 100 g with 0.1 U/kg, while no definite peak response was observed for acidity. Doses less than 0.1 U/kg tended to be ineffective as a stimulant and doses greater than 2.0 U/kg invariably produced convulsions and death. Return to control levels was usually observed within 4 hr. For all parameters, 400 μg/kg ICI-50123 gave peak responses. This occurred at 1 hr in the case of volume, acid output, and acid output per 100 g, and at 2 hr for acid concentration. When maximal responses to histamine, ICI-50123 and insulin were compared, it was found that gastric secretory volume and volume per 100 g responses were greater after ICI-50123 than after histamine and insulin. Levels of acid concentration after histamine and ICI-50123 were similar, but were lower following insulin-induced hypoglycemia than after histamine. Acid output and acid output per 100 g were higher after ICI-50123 than after histamine and insulin.

79 THE EFFECT OF SMALL BOWEL RESECTION ON GASTRIC ACID SECRETION IN THE RAT.

(E.) Caridis, D. T. (U. Aberdeen Med. Sch., Scotland), M. Roberts and G. Smith. *Surgery* 65(2):292-297, 1969.

Resection of 15 inches of small intestine, but not resection of 6 inches or simple transection of 3 inches, resulted in an increase of gastric acid secretion in male Lister rats. Massive resection also resulted in a slight but not significant increase in 4-hr free urinary histamine; simple transection did not significantly affect the excretion of free histamine. When histamine excretion was measured after s.c. administration of 1.0 mg histamine over a period of 4 hr, there was a significant increase in free histamine excretion in rats with a 15-inch resection, but little change from control values in animals with transection. The difference in histamine excretion between resected and transected rats was significant. Administration of 2.5-10.0 mg of histaminase (hog kidney diamine oxidase) i.m. per day for 3 days resulted in a highly significant decrease in gastric acid secretion in rats with the 15-inch resection as compared with resected rats given no histaminase. The 10-mg dose produced the maximum inhibition, but had no effect on gastric acid secretion of control animals. Urinary free histamine excretion did not show a statistically significant decrease with histaminase. The removal of histaminase-producing tissue during small intestinal resection apparently results in increased levels of endogenous histamine and accounts for the increased gastric acid secretion.

80 **STUDIES ON THE INHIBITION OF GASTRIC SECRETION BY THE SMALL INTESTINE.** *(E.)* Schuck, M. (Johns Hopkins U. Sch. Med., Baltimore, Md.), M. Santillana, L. Wise and W. F. Ballinger II. *Surg Gynec Obstet* 127(6):1295-1299, 1968.

To clarify the role of the small intestine in the complex neurohumoral regulation of gastric secretion, Heidenhain pouches and Thiry-Vella loops were constructed in healthy mongrel dogs. The loops were made from the proximal third of the small intestine in 3 dogs and from the middle third in 3 other dogs. After a 21-day recovery period, dogs were fasted for 18 hr; the volume and free acidity of pouch secretions during control periods and after stimulation with feeding or histamine administration were then determined. The Thiry-Vella loops were perfused with saline, 0.2 N HCl, and 50% dextrose. Perfusion of the loops and pouch collections were repeated after vagotomy. Inhibition of pouch secretion was elicited by acidification of the proximal third of the small intestine, while acidification of the middle third had no effect. The inhibitory effect of acid perfusion remained unchanged after vagotomy, but was abolished by pretreatment with methysergide maleate. This is felt to indicate a predominantly humoral mechanism, with serotonin being the agent most likely to be involved.

81 **GASTRIC ACID SECRETION IN CHRONIC URAEMIA AND AFTER RENAL TRANSPLANTATION.** *(E.)* Gingell, J. C. (Hammersmith Hosp., London, England), G. P. Burns and G. D. Chisholm. *Brit Med J* 4(5628): 424-426, 1968.

Gastric acid secretion was measured in 45 patients (30 males and 15 females, 17-70 yr old) with chronic uremia and in 22 controls (14 males and 8 females, 19-74 yr old) to determine whether hyposecretion of acid occurs in uremic patients during maximal histamine stimulation and to examine the effect of successful renal transplantation on gastric acid output. Basal acid output was the same in both groups. Maximal acid output in uremic patients was less than in the controls, but the difference was not significant. In the uremic patients maximal acid output was directly related to the duration of uremia and inversely related to both hemoglobin concentration and age. There was no relation between acid output and the level of the blood urea. The presence of secondary hyperparathyroidism was associated with a 50% increase in the maximal acid output, but the increase may have been due to the younger age of this group. Successful renal transplantation was followed by a considerable increase in acid output in 2 of 7 patients and both patients showed evidence of peptic ulceration.

82 **EFFECT OF VAGOTOMY ON THE GASTRIC SECRETION OF ACID, CHLORIDE AND PEPSIN IN RESPONSE TO AN ANTRAL STIMULUS AND TO INSULIN AND MAXIMAL HISTAMINE STIMULATION.** *(E.)* Tovey, F. I. (Holdsworth Mem. Hosp., Mysore City, South India), M. Swaminathan, K. Parker and A. Daniell. *Gut* 9(6):659-666, 1968.

Using a dye-dilution technique, the secretory response of the stomach to antral (3.5% sodium bicarbonate solution or 10% peptone solution), insulin (10-15 U i.v.), and histamine 0.04 mg/kg i.m. stimulation was investigated in South Indian duodenal ulcer patients prior to and 3 months after vagotomy. Ninety-seven subjects were studied preoperatively, 36 after total and 33 after selective vagotomy; not all procedures were performed in all patients. After vagotomy, the volume of basal secretion was reduced about 25% and that after insulin and histamine stimulation about 50%; volume following antral stimulation was variable. Emptying rates exceeded the secretory rates and were reduced by vagotomy. The concentration and output of acid in the basal, insulin and histamine groups was considerably reduced by vagotomy, but no constant effect of vagotomy on acid secretion was observed following antral stimulation with peptone. The mean acid output in response to peptone stimulation after vagotomy was about twice the output in response to maximal histamine stimulation, suggesting the after the operation the dose of histamine was no longer maximal. There was a significant reduction in pepsin concentration in the basal and insulin series after vagotomy (less than the reduction noted for acid secretion), and a variable change in concentration with peptone and histamine stimulation. The output was reduced in response to insulin or histamine, but there was no constant reduction in response to peptone. The pepsin secretion in response to antral stimulation was not uniformly altered. Patients with higher preoperative maximal histamine responses tended to show a greater fall in postoperative values. Total chloride concentrations were unaffected by vagotomy, while outputs reflected the changes in the volumes of secretion. This indicates that following vagotomy, the decline in H^+ ions is compensated for by an increase in other cations, the number of Cl^- ions remaining unchanged. The overall results show that selective vagotomy is no less effective than total vagotomy in all parameters tested. This means that no vagal innervation reaches the stomach via the celiac plexus and greater curvature.

83 **GASTRIC ACIDITY IN THE COMATOSE PATIENT.** *(E.)* Watts, C. C. (U. Texas Southwest. Med. Sch., Dallas) and K. Clark. *J Neurosurg* 30(2):107-109, 1969.

Gastric acid secretion was followed for 10 days, starting on the day of injury, in 10 comatose patients (7 males and 3 females, 13-50 yr old) with severe head injuries. In 5 of 6 decerebrate patients, acid secretion was in the hyperchlorhydric range (up to 112 mEq/12 hr), consistently approaching values observed in chronic peptic ulcer disease. All but one of the patients bled from the gastrointestinal tract (the exception was achlorhydric). Autopsy of one patient who died revealed multiple small gastric ulcers and hemorrhages. Among 4 comatose patients who were not decerebrate, most acid secretory values were within the normal range, although occasional values of 23, 26 and 30 mEq HCl/12 hr were encountered. Only 1 patient had gastric bleeding. These data do not explain the cause of the observed hyperacidity, nor do they indicate that hyperacidity alone is responsible for the gastrointestinal hemorrhage. It is suggested that gastric acidity be monitored in comatose patients.

84 **EFFECT OF ORALLY ADMINISTERED PROSTAGLANDIN E_1 ON GASTRIC SECRETION AND GASTROINTESTINAL MOTILITY IN MAN.** *(E.)* Horton, E. W. (Sch. Pharm., U. London, England), I. H. M.

Main, C. J. Thompson and P. M. Wright. *Gut* 9(6):655-658, 1968.

Oral administration of prostaglandin E_1 (10-40 μg/kg) to 3 adult males did not measurably reduce the gastric secretory response to pentagastrin (6 μg/kg s.c.), in contrast to previous results in rats. At high doses, there was a pronounced increase in intestinal motility, resulting in loose feces from 2-4 hr after administration. Prostaglandin E_1 also resulted in the presence of large quantities of bile in gastric samples. It is suggested that this is due to reflux of duodenal contents resulting from relaxation of the pyloric sphincter.

35 **RESPONSE TO GASTRIN PENTAPEPTIDE IN CHILDREN.** *(E.)* Lari, J. (Royal Infirm., Sheffield, England), J. Lister and H. L. Duthie. *J Pediat Surg* 3(6):682-690, 1968.

Pentagastrin (6 μg/kg i.m.) was given to 47 children (1 month-.4 yr old; 13 with sliding hiatal hernias, 15 with unexplained ecurrent abdominal pain, 4 with feeding gastrostomies for treatment of esophageal atresia, 8 with esophageal reflux but no iatal hernia, 5 with duodenal ulcers, and 2 with gastric ulcers) o test the gastric acid output. The peak response of 4 mEq cid/hr/10 kg body weight was noted within 40 min. The 7 atients with peptic ulcers tended to have slightly higher acid utputs, but the difference was not significant compared to the ther groups. There was a significant correlation, however, etween peak acid output and both weight and age. The echnique used to recover the gastric secretions (nasogastric ibe or gastrostomy tube) was 92% efficient in 14 children udied, using polyethylene glycol as an inert marker. The results seen in these children are similar to those seen with adults. he use of pentagastrin in tests of gastric acid secretion in children is advocated in preference to the histamine test, since it shorter and is less upsetting to the child.

GASTRIC SECRETORY RESPONSE TO SYNTHETIC HUMAN GASTRIN: STUDY OF THE FFECT OF NEPHRECTOMY. *(E.)* Trueblood, H. W. tanford Med. Sch., Palo Alto, Calif.), S. Kohatsu and H. A. erhelman Jr. *Arch Surg* 98(2):223-224, 1969.

e effect of nephrectomy on dose-response curves to synetic human gastrin (1-24 μg/kg s.c.) was studied in pyloricated, vagotomized, male Sprague Dawley rats in order to dermine the role of the kidneys in the elimination of gastrin m the body. At each dose of gastrin used there was no significant difference between the group that had undergone nephrectomy and the group with intact kidneys. There was also no significant difference between the 2 distinct regression lines, nor between the levels of basal secretion in the 2 groups. There was, however, a definite response to synthetic gastrin in all rats. These results indicate that the kidneys probably do not represent the main pathway for gastrin excretion.

87 **PROTEOLYTIC ENZYMES OF THE GASTRIC JUICE.** *(E.)* Tang, J. (U. Oklahoma Med. Ctr., Oklahoma City) and S. Wolf. Pp 186-194 in *Progress in Gastroenterology.* Vol. 1 Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

88 **GASTRIC INTRINSIC FACTOR AND OTHER VITAMIN B_{12} TRANSPORT PROTEINS: CHEMICAL AND PHYSIOLOGIC PROPERTIES.** *(E.)* Simons, K. (Rockefeller Inst., New York City). Pp. 195-220 in *Progress in Gastroenterology* Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

89 **GASTRONE, ENDOGENOUS INHIBITOR OF GASTRIC SECRETION.** *(E.)* Glass, G. B. J. (New York Med. Coll., New York City) and C. F. Code. Pp. 221-247 in *Progress in Gastroenterology.* Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

90 **MICROELECTRODE STUDIES OF DOG'S GASTRIC MUCOSA.** *(E.)* Canosa, C. A. (Med. Ctr. U. Alabama, Birmingham) and W. S. Rehm. *Biophys J* 8(4): 415-430, 1968.

91 **GASTRIC SECRETION IN THE PYLORUS-LIGATED GERBIL** *(MERIONES UNGUICULATUS)* *(E.)* Thompson, J. H. (UCLA Sch. Med., Los Angeles, Calif.) and R. Wilson. *J Appl Physiol* 16(1):61-76, 1969.

92 **A RADIAL DIFFUSION ASSAY FOR PEPSINOGEN AND PEPSIN.** *(E.)* Samloff, I.M. (U. Rochester Sch. Med., N.Y.) and M. S. Kleinman. *Gastroenterology* 56(1):30-34, 1969.

93 **GASTRIC ACID SECRETION AFTER THE INGESTION OF SOLID FOOD: A COMPARATIVE STUDY OF GASTRIC ACID SECRETORY CAPACITY IN RESPONSE TO SOLID FOOD AND HISTAMINE.** *(E.)* Rune, S. J. (Dept. Clin. Physiol., U. Copenhagen, Denmark). *Scand J Gastroent* 3(Suppl 1):11-61, 1968.

See also: 7,8,13,104,221,237,255,364,374,395,

Pancreas

94 ADAPTATION OF ENZYME ACTIVITY OF THE RAT PANCREAS ON ALTERED FOOD INTAKE. *(E.)* Bucko, A. (Res. Inst. Human Nutrit., Bratislava, Czechoslovakia) and Z. Kopec. *Nutr Dieta* 10(4): 276-287, 1968.

The biochemical adaptation of the pancreas to a change in food intake was studied in 4 groups of adult male Wistar rats kept on either a normal balanced diet (61% starch, 24% casein, 9% oil), a high-carbohydrate diet (75% starch), a high-protein-diet (70% casein) or a high-fat diet (58% oil) for 4 weeks. Studies of pancreas homogenates at the end of this period revealed a marked increase of the particular enzymes necessary for digesting the substrate occurring in excess in the diet. In the case of the high-carbohydrate diet, the amylase activity rose by 135.9%, along with a 39.6% rise in protease activity, which is also statistically significant; lipase fell to 24.9% of normal. After adaptation to the high-protein diet, a marked increase in protease activity was accompanied by a significant decrease in lipase (to 58.6%) and a slight fall in amylase (to 96.5%). The high-fat diet caused a significant (33.1%) increase in lipase activity and a slight decrease in amylase activity (to 85.2%); protease activity fell to 87.7%.

95 PANCREATIC ACINAR CELL REGENERATION. VI. ESTIMATION OF ERROR OF THE AUTORADIOGRAPHIC LABELING INDEX (THYMIDINE-H^3)–MAXIMUM POSSIBLE ERROR (MPRE) AND SENSITIVITY (S). *(E.)* Carol, B. (State U. New York Downstate Med. Ctr., Brooklyn, N. Y.) and P. J. Fitzgerald. *Amer J Path* 53(6): 971-987, 1968.

From an experiment in which DNA synthesis of rat pancreas acinar cell nuclei was studied by autoradiography and ^{3}H-thymidine, randomized samples of the data were used to estimate the variance of the labeling index (proportion of labeled cell nuclei); tables were then constructed from which the overall maximum possible relative error (MPRE) of the experiment could be estimated. The MPRE is an estimate of error in relation to the sample average and is a more refined error estimate than that given by the standard deviation or the standard error. The MPRE tables showed that an increase in animal number caused the most reduction in overall error. A comparable per-unit increase in the number of counters had far less of an effect, and relatively minimal effects were noted after similar increases in the number of duplicate counts or the number of nuclei counted per count. Sensitivity tables were also developed which estimate, for varied numbers of an experimental component, the probability of detecting hypothetical labeling indexes which differ from a hypothetical null hypothesis by specified percentages, or the probability of detecting a specified average difference in labeling indexes between test and control groups. MPRE tables, by indicating the relative contribution made by individual components to overall error, give a flexibility to experimental design permitting the investigator to modify the numbers of the components in the experiment. Sensitivity tables indicate the relative value of varying the number of different experimental components and provide a precise estimate of the number of components needed to detect specified differences between labeling indexes.

96 RELATIONSHIP BETWEEN BICARBONATE, CHLORIDE, AND VOLUME FLOW AT HIGH SECRETORY RATES IN THE PANCREATIC JUICE OF THE DOG. *(E.)* Ribet, A. C. (Purpan Hosp., Toulouse, France), J. P. Pascal, N. Vaysse and J. P. Boucard. *Scand J Gastroent* 3(4):401-406, 1968.

An increasing volume of pancreatic secretion with a drop in bicarbonate concentration and a rise in chloride concentration was observed in 10 dogs (7-25 kg) with cannulated pancreatic ducts following infusion of secretin at 3-150 U/kg/hr. For volumes below 15 μl/min/g of wet pancreas tissue, bicarbonate and chloride concentrations behaved in the classical manner; for volumes exceeding 15 μl/min/g, however, dissociation of the 2 parameters was obtained. It is assumed that the relation between water and anion secretions is the result of the pharmacological properties of secretin itself; any possible role of bile admixture is negated by the fact that the pancreatic duct had been cannulated. Although the exchange theory can account for the secretory pattern observed at low-moderate flow rates, the response at high flow rates is best accounted for by a 2-component hypothesis, the secretion of bicarbonate-rich and chloride-rich juice being stimulated to unequal degrees by secretin.

97 EXOCRINE PANCREATIC SECRETION AFTER INFILTRATION OF THE LEFT SPLANCHNIC NERVE. *(It.)* Gemma, G. B. (Inst. Gen. Clin. Surg., U. Genoa, Italy), E. Berti-Riboli and C. Berretti. *Riforma Med* 82(40):1102-1107, 1968.

In 4 patients with external pancreatic fistulas, the method of Minnitt and Gillies was used every 24 hr for 3 days to infiltrate the left splanchnic nerve with 15-20 ml of 1% procaine. Electrolytes, amylase, lipase, and trypsin in the pancreatic juice and the volume of pancreatic secretion were studied in the 6 hr before infiltration and at various intervals thereafter. Except for 1 case in which pancreatic secretion increased slightly after infiltration, there were no significant differences in the volumes of pancreatic secretion before and after infiltration. Na and K concentrations remained almost the same, while bicarbonate concentrations increased in 1 case and decreased in another. Enzyme activities remained the same in 3 cases and increased after infiltration in another. The increase was most marked for trypsin. These findings indicate that infiltration of the left splanchnic nerve does not produce any appreciable changes in pancreatic secretion.

98 PANCREATIC ACINAR CELL REGENERATION V. ANALYSIS OF VARIANCE OF THE AUTO RADIOGRAPHIC LABELING INDEX (THYMIDINE–H^3). *(E.)* Fitzgerald, P. J. (State U. New York Downstate Med. Ctr., Brooklyn, N. Y.), B. Carol, L. Lipkin and L. Rosenstock *Amer J Path* 53(6):953-970, 1968.

The components of error in determinations of the labeling index (% radioactively labeled cell nuclei) of rat pancreas acinar cells were evaluated by means of a new microscopic field selection technique employing a mechanical stage and tables of random numbers. Thymidine-^{3}H (0.25 μC/g i.p.) was used as the label for the pancreatic nuclei. Five counter were employed in the variance analysis; 5 autoradiograms, epared with a fluid emulsion technique, were selected for ounting from each of 3 groups of animals: normal controls, ts receiving a liver operation, and rats receiving a pancreas eration. The resulting indexes were scaled by their estim- ed standard deviations and these values were compared. nimal variance accounted for the highest percentage of total riance; intercounter variance was significant but inconsistent, ggesting the use of multiple counters; and significant intra- unter variance suggested the value of duplicate counts. The sults indicate the primary importance of animal number in y attempt to reduce experimental variation. The auto- diographic technique proved to be an unimportant source variation. Determination of the relative component var- nce in control and several experimental groups is recom- ended for each study to be performed.

PANCREATIC EXOCRINE FUNCTION FOLLOWING MESOCAVAL SHUNTING. *(E.)* Rudick, J. lount Sinai Sch. Med., New York, N. Y.), M. J. Zerpa and A. Dreiling. *Ann Surg* 169(1):67-73, 1969.

e secretory capacity of the pancreas in response to i.v. cretin (1-5 U/kg) or a combined i.v. injection of secretin d pancreozymin was tested in 5 unanesthetized dogs starting weeks after mesocaval shunting and in 2 unanesthetized sham- erated controls. In shunted dogs, the upper end of the divided ferior vena cava was anastomosed to the superior mesenteric in and this vein was ligated above the shunt so that most of e venous return from the lower intestines (but not that from e stomach, duodenum, pancreas or spleen) was shunted around e liver. As a result, the mean 15-min volume response to cretin was depressed by 31-33% and the mean bicarbonate tput by 35-36%, although the bicarbonate concentration was nificantly reduced only by maximal doses. The decrease in carbonate concentration, when present, was proportional to e decrease in flow. Amylase output in response to secretin d pancreozymin was depressed by 40% after mesocaval shunt- , while the amylase concentration was only slightly reduced. all samples, the chloride concentration was increased and tput was slightly decreased after shunting. Sham operations not alter any of the parameters of pancreatic function. unting produced no detectable changes in liver function, nor re macroscopic or microscopic alterations found in the liver pancreas at autopsy. It is concluded that the decreased re- nse of the pancreas following mesocaval shunting is not due the vagal denervation of the pancreas, decreased pancreatic od flow, deranged liver function or operative trauma. The ibitory influences on pancreatic secretion may arise pre- minantly from the jejunum, ileum and colon. Decreased ncreatic secretion may play a role in the etiology of post- nt hyperchlorhydria and peptic ulceration.

) **EFFECT OF DIET ON THE FUNCTION AND MORPHOLOGY OF THE RAT PANCREAS. V. FECT OF DIFFERENT TYPES OF CARBOHYDRATES AMYLASE SYNTHESIS IN THE PANCREAS.** *(Sl.)* čko, A. (Res. Inst. Human Nutrit., Bratislava, Czechoslovakia), Šimko and Z. Kopec. *Cesk Gastroent Vyz* 22(6):420-426, 58.

ncreatic amylase activity and the serum levels of cholesterol esterified fatty acids were compared in adult male albino maintained on semisynthetic diets with isocaloric amounts (47 kcal %) of various carbohydrates (glucose, fructose, galactose, sucrose and starch) for 84 days. A glucose diet resulted in a 33% greater increase in pancreatic amylase activity than a starch diet (38.9 U compared to 23.0 U) and 3 times as great an increase as a fructose or sucrose diet (12.1-13.4 U). The latter also produced an increase in serum lipids, which was accompanied by an increase in pancreatic lipase activity (to 61.2-74.3 U compared to 54.9 U on a starch diet). The pancreatic protease activity was highest (average 17.34 U) in rats on a fructose diet and lowest in those fed galactose (2.25 U), which also resulted in amylase and lipase activities of only 6.15 and 38.92 U, resp. The liver cholesterol was somewhat higher in rats on a galactose diet (313.5 mg% compared to 283.6-296.3 in the others), while the liver esterified fatty acid levels were highest on a glucose diet (19.6 mEq/100 g compared to 11.5-14.1 in rats fed starch, fructose or sucrose and 8.7 mEq/100 g in rats fed galactose). It is concluded that the adaptation of the rat pancreas to alterations in the diet is mediated by the humoral route and depends on the breakdown products of foods reaching the acinar cells of the pancreas.

101 **THE EFFECT OF ANESTHESIA OF THE LEFT SPLANCHNIC NERVE ON EXOCRINE PANCREATIC SECRETION IN DUODENECTOMIZED PATIENTS.** *(It.)* Berti Riboli, E. (Inst. Gen. Surg. Clin., U. Genoa, Italy), C. Berretti and G. B. Gemma. *Riforma Med* 82(44):1209-1213, 1968.

The technique of Minniti and Gillies was used to infiltrate the left splanchnic nerve in 2 patients whose duodena had been almost completely removed because of neoplasms and who had external pancreatic fistulas. The nerve was infiltrated with 20 ml of 1% procaine on 3 successive days. During treatment patients received only water p.o. and fluids and electrolytes i.v. Pancreatic flow decreased immediately and either stopped completely or decreased to very low levels after the 3rd infiltration. This was largely due to a decrease in the water content of the pancreatic juice. Bicarbonate concentrations decreased, chloride concentrations increased, and enzyme activities increased greatly. These atypical results are attributed either to a decrease, followed by a cessation, in autonomic excitosecretory stimuli or to an inhibitory action of the splanchnic nerve which antagonizes vagal stimuli. The absence of hormonal control from the duodenum doubtlessly affected the nature of this response.

102 **RELATIONSHIP BETWEEN PANCREOZYMIN AND CHOLINERGIC STIMULATION OF PANCREATIC SECRETION.** *(E.)* Nakumura, M. (Sch. Med., Creighton U., Omaha, Neb.), G. English and D. F. Magee. *Canad J Physiol Pharmacol* 47(1):33-38, 1969.

The relation between hormonal control of pancreatic secretion and the effects of cholinergic and anticholinergic agents was studied by analyzing the dose-response curves after various sequences and doses of pancreozymin (PZ) and methacholine. In 9 of 16 dogs (10-15 kg) fitted with external pancreatic fistulae, low gastroenterostomies were performed after division of the stomach at the pylorus; in the other 7 dogs, a mucosal septum was made at the pyloric sphincter to divide the stomach from the duodenum and the proximal edges of the antral mucosa and muscle were used to make a gastroenterostomy (pancreatic innervation preserved). Both preparations were fitted with simple gastric fistulae. All drugs were given by continuous i.v. infusion except for atropine (single i.v. injection, 1 mg/dog) and pentolinium (0.5 mg/kg i.v. and 0.5 mg/kg s.c. initially, followed by 0.5 mg/kg s.c. every 30 min). An i.v. infusion of secretin (except in controls, when methacholine was used alone) sufficient to give 2 ml pancreatic juice/5 min was started, after the gastric fistula was opened, and the following dose-response comparisons (for total protein, lipase, and amylase) were made: a) varying methacholine (up to 8 µg/min) with and without background secretin, b) varying methacholine (up to 8 µg/min) and background secretin with and without background PZ (2 U/min), c) varying PZ (up to 4 U/min) plus background secretin with and without background methacholine (up to 2 µg/min), and d) varying methacholine (up to 8 µg/min) or varying PZ (up to 4 U/min), both with continuous secretin before and after atropine or pentolinium. Combinations of methacholine and PZ depressed amylase, lipase, and total protein secretion when high doses were used (above 2 U/min PZ with 2 µg/min methacholine as background, and above 4 µg/min methacholine with 2 U/min PZ as background). Atropine depressed the enzyme response to Boots but not to Jorpes PZ. It did not alter the depression produced by high doses of PZ and methacholine in combination. These data are consistent with the view that the actions of PZ and methacholine on enzyme production are closely related.

103 **NOREPINEPHRINE BIOSYNTHESIS IN THE RAT PANCREAS.** *(E.)* Symchowicz, S. (Biol. Res. Div., Schering Corp., Bloomfield, N. J.), C. Korduba, J. Veals and I. I. A. Tabachnick. *Biochem Pharmacol* 17(11): 2313-2317, 1968.

The *in vivo* biosynthesis of norepinephrine was studied in rat pancreas with ^{14}C-dopamine as the precursor. Male albino rats received 0.26 mg/kg of 1-^{14}C-labeled dopamine i.m. At selected time intervals after injection, rats were sacrificed and the content of catecholamine and its metabolites in heart, spleen, and pancreas was determined. Labeled dopamine was taken up and metabolized by pancreatic tissue, and norepinephrine was the major transformation product found in the pancreas. Dopamine was metabolized faster in the pancreas than in the heart or spleen. On the other hand, the radioactivity at 30 and 120 min intervals was higher in the heart and spleen than in the pancreas. It is concluded that the pancreas is capable of uptake and synthesis of catecholamines to a degree comparable to that of other sympathetically innervated tissues, thus indicating that catecholamines may have an important biological function in the pancreas.

104 **EFFECTS OF GASTRIN AND PENTAGASTRIN ON GASTRIC AND PANCREATIC SECRETION IN DOGS.** *(E.)* Emas, S. (VA Ctr., Los Angeles, Calif.), A. Billings and M. I. Grossman. *Scand J Gastroent* 3(3):234-240, 1968.

Porcine gastrin and pentagastrin were compared as stimulants of gastric and pancreatic secretion in conscious dogs. The maximal acid output was greater and the dose response curve for acid output was steeper in response to gastrin than to pentagastrin in the vagally denervated main stomach. These differences were not found in vagally denervated pouches. The shape of the dose-response curve for pepsin output in response to gastrin sponse to pentagastrin occurred with doses that were submaximal for acid secretion (resembling histamine). The slope of the dose response curve for protein output from the pancreas was steeper in response to gastrin than to pentagastrin whereas the curves for bicarbonate output were parallel. The maximal pancreatic output of bicarbonate with gastrin and pentagastrin did not differ significantly. It is concluded that there are important differences between gastrin and pentagastrin in their effects on gastric and pancreatic secretion.

105 **EXTRACORPOREAL PERFUSION OF THE DUODENOPANCREAS IN THE DOG: TECHNICAL PROCEDURES AND PANCREATIC FUNCTION.** *(Fr.)* Grenier, J. F. (Surg. Clin. B., Strasbourg, France), M.Gillet, J. Kachelhoffer, P. Wong, A. Klein, A. M. Barth, P. Stoebner and A. G. Weiss. *C R Soc Biol (Paris)* 162(3):766-770, 1968.

106 **THE EFFECT OF GLUCAGON ON ENDOCRINE AND EXOCRINE PANCREATIC SECRETION.** *(Ger.)* Kaess, H. (Med. Clin., U. Heidelberg, Germany), W. Brech and G. Schlierf. *Klin Wschr* 46(24):1314-1315, 1968.

107 **COMPARISON OF SUBCUTANEOUS AND INTRAVENOUS SECRETIN IN MAN.** *(E.)* Isenberg, J. I. (UCLA Sch. Med., Los Angeles, Calif.) and M. I. Grossman. *Gastroenterology* 56(1):88-91, 1969.

See also: 9,206,288

108 THE DISAPPEARANCE OF INTRAVENOUSLY INJECTED PANCREATIC ENZYMES. *(E.)* ppert, H. E. (Hahnemann Med. Coll., Philadelphia, Pa.), M. imbiloglu, F. W. Pairent and J. M. Howard. *Surg Gynec bstet* 127(6):1281-1287, 1968.

ancreatic juice was collected from the pancreatic duct of onor dogs and injected i.v. into recipient dogs in order to etermine the importance of extraurinary mechanisms in the emoval of enzymes from the blood. Serial measurements ere made of the serum enzyme levels and the urinary exretion of the enzymes in the recipient dogs. The serum ipase and amylase concentrations in the recipient dogs rose o high levels, but fell to normal levels within a few hours. he urinary excretion of amylase and lipase did not account or the disappearance of the enzymes from the serum. Sevral million units of amylase and up to 25,000 units of lipase ere cleared from the blood within a few hours. These reilts complement the studies of other investigators who found iat the liver can remove large amounts of amylase from the lood.

09 HEPATIC β-LIPOPROTEIN SYNTHESIS FOLLOWING EXPERIMENTAL CARBON TETRACHLORIDE POISONING. *(Fr.)* Albano, O. (Inst. Spec. Med. ath., U. Bari, Italy) and A. Francavilla. *Path Biol* 16(15-16/17-8):735-738, 1968.

s determined by the incorporation of ^{14}C-leucine and ^{3}Halmitic acid into the β-lipoproteins of the liver and serum, ipoprotein synthesis in male Wistar rats was significantly dereased within 1 hr after oral administration of 1 ml CCl_4 in live oil (1:1). While palmitic acid incorporation was relatively table after the 1st hr, particularly in the liver, leucine incorpration continued to decrease over the next 4 hr. Hepatic TP levels did not drop significantly until after the 3rd hr, hile hepatic triglyceride levels began to increase rapidly after he 1st hr (and plasma triglycerides decreased sharply even uring the 1st hr). It is concluded that inhibition of hepatic -lipoprotein synthesis and decreased mobilization of hepatic riglycerides are important factors in the etiology of fatty liver ue to CCl_4.

10 METABOLIC CHANGES FOLLOWING PARTIAL HEPATECTOMY IN DOGS. *(E.)* Aronsen, K. F. almo Gen. Hosp., Sweden) and B. Ericsson. *Acta Chir Scand* 4(3/4):282-286, 1968.

iver function was studied during the postoperative period in mongrel dogs (7-14 kg) which were subjected to liver rection of up to 60% under pentobarbital anesthesia without tense postoperative treatment with carbohydrates, proteins, d electrolytes. In 6 dogs, tissue was resected from all the er lobes, while in the other 7 dogs the 2 left lateral liver lobes ere removed. Changes in hemoglobin and hematocrit values, hich decreased temporarily and returned to normalcy about 6 weeks postoperatively, were probably due to the loss of ood during the operation and the postoperative aggregation blood cells within the vascular system. The SGPT reached peak on the 1st and 2nd postoperative days and fell to preerative levels 20 days after the operation; serum bilirubin o reached a maximum (mean 0.47 mg%) on the 1st and 2nd stoperative days and then declined, reaching preoperative values (mean 0.19 mg%) about 6-7 days after the operation; BSP retention initially increased slightly and then decreased, reaching the lowest point 5-6 weeks after the operation; the serum proteins fell initially and returned to preoperative levels about 14 days after the operation; these changes are all ascribed to the loss of liver cell mass and acute injury to the remaining liver tissue. Values for total serum fat (mean 499 mg%), blood sugar, urea, creatinine, standard bicarbonate, calcium, sodium, and potassium were not severely affected by partial hepatectomy, and liver function had returned to normal within 5-6 weeks after the operation.

111 THE INDUCTION OF δ-AMINOLEVULINIC ACID SYNTHETASE *IN VIVO* IN CHICK EMBRYO LIVER BY NATURAL STEROIDS. *(E.)* Kappas, A. (Rockefeller U., New York City), C. S. Song, R. D. Levere, R. A. Sachson and S. Granick. *Proc Nat Acad Sci USA* 61(2):509-513, 1968.

Injection of 5β-pregnane-3α,17α-diol-11,20-dione into the yolk sacs of 16-day-old chick embryos resulted in an increase of δ-aminolevulinic acid (ALA)-synthetase activity in the liver homogenates. A detectable increase in ALA-synthetase appeared within 2 hr and increased sharply to maximum levels about 8 hr after injection; activity then declined rapidly. The enzyme response was proportional to the amount of steroid injected up to 5 mg, but diminished with larger doses. Other metabolites of the 5β-H configuration (etiocholanolone, etiocholanedione, pregnanedione, 11-ketopregnanolone) also increased enzyme activity, but primary endocrine secretions, such as progesterone, testosterone, estradiol and cortisol, had little or no effect, suggesting a structural requirement for such action. Simultaneous injection of actinomycin D (250 μg/egg) or cycloheximide (5 μg/egg) inhibited the stimulation of ALA-synthetase activity by 80-96%, which corresponds with previous results in tissue culture and rat liver. These results suggest that the porphyrin-inducing action of natural steroids, previously noted in chick embryo liver cell cultures, is mediated by induction of ALA-synthetase activity in the liver.

112 IDENTIFICATION OF HUMAN HEPATIC GLUCOKINASE AND SOME PROPERTIES OF THE ENZYME. *(E.)* Pilkis, S. J. (Dept. Physiol., U. Chicago, Ill.). *Proc Soc Exp Biol Med* 129(3):681-684, 1968.

Glucokinase, a hexokinase type enzyme with a high K_m (10^{-2} M) toward glucose, was identified in normal human liver tissue obtained from a 24-yr-old Negro male. The enzyme was separated from low K_m hexokinases (10^{-4} M or less) by passage through Sephadex G-100. The glucokinase activity in human liver was 1.5 times that of low K_m hexokinases, in contrast to the 4-fold difference previously found in rat liver. In other respects, the human enzyme was found similar to that of the rat: migration rate during starch gel electrophoresis, an apparent molecular weight by the Sephadex G-100 gel filtration method of 48,000 and specific inhibition by an antibody to rat hepatic glucokinase.

113 HEPATIC ALTERATIONS FOLLOWING EXPERIMENTAL TETRACYCLINE TOXICITY

SECRETION AND METABOLISM

IN RATS. *(E.)* Zussman, W. V. (Springfield Hosp., Mass.). *Anat Rec* 162(3):301-312, 1968.

Toxic doses of tetracycline (250 mg/kg) were injected i.v. in adult female rats to study the morphologic and cytochemical alterations produced in the liver. Of the 28 animals treated, 50% died within 48 hr; those surviving were sacrificed 3, 7, 10, or 14 days later. Histologic sections of the livers taken from all animals were studied utilizing a specific fluorescence technique to determine tetracycline uptake and storage, and with histochemical procedures for alkaline phosphatase and succinic dehydrogenase activity. Varying degrees of degeneration were observed in the livers of animals dying acutely. Basophilic lamellated bodies and focal venous thrombosis were noted in the surviving animals at 7 and 14 days, resp. Tetracycline fluorescence was visualized initially within bile canaliculi and random hepatic cells, and later within dilated interstitial spaces as well as in the basophilic bodies. By 14 days, residual fluorescence was limited to the parenchyma adjacent to thrombosed central veins. Succinic dehydrogenase activity was diminished within areas of tetracycline accumulation and minimally increased where the cytologic damage was greatest. Alkaline phosphatase activity present about the central veins and in areas of tetracycline-induced fluorescence reflected parenchymal distortion.

114 STUDIES ON THE METABOLIC N-DEMETHYLATION. V. EFFECT OF PHENOBARBITAL ON THE OXIDATIVE DEMETHYLATION *IN VITRO* IN THE LIVER OF ADRENALECTOMIZED RATS. *(E.)* Minegishi, K. (Tohoku U. Sch. Med., Sendai, Japan), Y. Kuroiwa and S. Okui. *Chem Pharm Bull* 16(9):1643-1648, 1968.

The effects of phenobarbital (500 µmoles/kg 24 hr before sacrifice) and cortisone (5 or 25 mg/kg/24 hr for 3 days) on the microsomal drug-metabolizing enzymes were determined in intact and adrenalectomized male Wistar rats. Bilaterally adrenalectomized animals were maintained on 0.09% saline, and biochemical studies were made 3 days after adrenalectomy. In some animals, puromycin or 8-azaguanine were given i.p. before sacrifice at doses of 10 mg/kg every 2 hr and 100 mg/kg every 15 hr, resp. Some animals received ^{14}C-labeled amino acids i.p. 2 hr before sacrifice. The activities of the hepatic demethylating enzymes were decreased by adrenalectomy, but were stimulated by administration of phenobarbital or cortisone. Incorporation of ^{14}C-labeled amino acid into liver microsomal proteins of adrenalectomized rats was increased by administration of phenobarbital. The magnitude of the phenobarbital effect was decreased, however, by pretreatment with puromycin or 8-azaguanine.

115 ULTRASTRUCTURAL CHANGES IN LIVER PARENCHYMAL CELLS OF THE MOUSE FOLLOWING POSTNATAL CHOLECYSTECTOMY. *(E.)* Yamada, K. (Nagoya U. Sch. Med., Japan). *Anat Rec* 162(3): 373-385, 1968.

A total of 18 weanling (20-day-old) mice of both sexes was divided into 3 groups: 7 mice were cholecystectomized, 4 mice were sham operated, and 7 mice were kept intact as nonoperated controls. Animals were sacrificed 60 days after the operation, and the ultrastructural changes induced by cholecystectomy in liver parenchymal cells were studied. The major changes included a frequent occurrence of numerous vesicles, extensive forms of copious Golgi apparatus, an increase in the number of lysosomes and microbodies in the peribiliary cytoplasm, and dilatation of the bile canaliculi. The cytoplasm beyond the peribiliary zone contained numerous large mitochondria associated with abundant granular endoplasmic reticulum. These changes suggest an elevated activity of bile secretion in cholecystectomized mice, presumably as a compensatory adaptation to the loss of bile concentrating ability of the biliary system.

116 EFFECT OF SODIUM PHENOBARBITAL ON BILIRUBIN METABOLISM IN AN INFANT WITH CONGENITAL, NONHEMOLYTIC, UNCONJUGATED HYPERBILIRUBINEMIA, AND KERNICTERUS. *(E.)* Crigler, J. F. Jr. (Children's Hosp. Med. Ctr., Boston, Mass.) and N. I. Gold. *J Clin Invest* 48(1):42-55, 1969.

Sodium phenobarbital and various hormones capable of inducing hepatic enzyme formation were given to an infant boy with congenital, nonhemolytic, unconjugated hyperbilirubinemia and severe kernicterus for prolonged periods between the ages of 2 and 25 months to determine their effect on serum bilirubin concentrations. On 2 occasions, phenobarbital (5 mg/day orally) decreased serum bilirubin concentrations approximately threefold over a period of 30 days. Withdrawal of phenobarbital resulted in a gradual (30 days) return of serum bilirubin to pretreatment levels. Orally administered L-triiodothyronine (0.05-0.1 mg/day for 71 days), i.m. human growth hormone (1 mg/day for 21 days), and testosterone propionate (0.1 mg/day for 9 days) did not decrease serum bilirubin levels below the lowest control value of 18 mg/100 ml. Studies done with radioactive bilirubin during phenobarbital therapy showed that the threefold decrease in serum bilirubin concentration and total body pool resulted from a comparable decrease in bilirubin half-life without a significant change in turnover. Electron microscopic and enzymologic studies of the liver showed that both the hepatocyte content of the agranular endoplasmic reticulum and the ability of liver homogenates to conjugate p-nitrophenol were significantly increased during phenobarbital treatment. The observations suggest that phenobarbital affects bilirubin metabolism by the induction of an enzyme(s) with a slow rate of degradation (or rapid rate of degradation with limited capacity).

117 INTERRELATIONSHIPS BETWEEN LIVER COMPOSITION, PLASMA GLUCOSE AND KETONES, AND HEPATIC ACETYL-CoA AND CITRIC ACID DURING PROLONGED STARVATION IN THE MALE RAT. *(E.)* Herrera, E. (Northwestern U. Med. Sch., Chicago, Ill.) and N. Freinkel. *Biochim Biophys Acta* 170(2):244-253, 1968.

Male rats were starved for 0, 6, 24, 48, 72, and 120 hr to compare the fed state with phases of starvation ranging from the early mobilization of fat to the depletion of peripheral depots. Hepatic levels of acetyl-CoA and citric acid were correlated with liver composition, plasma glucose and ketone levels. Hepatic DNA remained constant throughout the starvation period, whereas liver water, protein, glycogen, phospholipids and esterified fatty acids all decreased. Glycogen displayed the earliest reductions, being significantly reduced after 6 hr and reaching a minimum at 48 hr, after which it increased. The total hepatic content of acetyl-CoA was increased significantly after 6 hr of starvation, returned to 'fed' values after 24 and 48 hr, and decreased significantly thereafter. Total liver citric acid declined to the lowest values after 48 hr and showed a secondary rise to 50% of the values seen in fed animals after 120 hr. Plasma ketones exhibited reciprocal changes: ketonemia was maximal after 48 hr and fell with continued fasting. Administration of insulin (with glucose to prevent hypoglycemia) to rats starved for 48 hr abolished the ketonemia and restored liver citrate without altering hepatic acetyl-CoA.

118 **AN AUTORADIOGRAPHIC STUDY OF PROTEIN SYNTHESIS IN MOUSE LIVER PARENCHYMAL CELLS DURING CCl_4 INTOXICATION.** *(E.)* Monlux, G. (Dept. Path., U. Washington, Seattle) and E. A. Smuckler. *Amer J Path* 54(1):73-82, 1969.

Hepatic protein synthesis was studied in male Balb/C mice after administration of CCl_4 (0.25 ml/100 g body weight) by stomach tube. Control animals received mineral oil (0.5 ml/100 g). At 1, 3, 6, and 12 hr after CCl_4 administration, 2 control and 2 treated mice were given 20 μC/g L-leucine-4,5-^3H via the tail vein; animals were killed 45 min later. The livers of all control animals showed uniform labeling of parenchymal cells, with little labeling over blood spaces. Sections of ileum showed many intensely labeled cells in intestinal crypts, and sections of pancreas showed intense labeling over zymogen granules. Within 2 hr after CCl_4 administration, there was a grossly discernible reduction in the labeling of the cells of the central and midzones in the liver. The transition between the periportal zone and midzone and central zone was abrupt. The Kupffer cells were unaffected. After 6 hr, there was an apparent increase in labeling in the midzonal area. Examination of the duodenum, ileum, pancreas, and kidney failed to show any differences between CCl_4-treated and control animals. The extent of functional loss as judged rom these studies correlated well with biochemical assays for lecreased liver function.

19 **DOSE-RESPONSE RELATIONSHIPS OF THE CHOLERETIC EFFECT OF HISTAMINE.** *(E.)* ones, R. S. (VA Ctr., Los Angeles, Calif.) and M. I. Grossman. *mer J Physiol* 216(2):335-339, 1969.

ive mongrel dogs were prepared by cholecystectomy, ligation f the lesser pancreatic duct, and insertion of gastric and duoenal cannulas. Through the duodenal cannula, the common ile duct was cannulated. The flow and composition of hepatic ile were then observed during i.v. infusion of NaCl, NaCl plus istamine (0.01-0.32 mg/kg/hr), NaCl plus sodium taurocholate 96 μEq/15 min), and NaCl plus sodium taurocholate and istamine. Bile flow increased with increasing doses of histmine up to 0.16 mg/kg/hr, producing flows of 1.7 ml/15 min ove controls. Histamine produced an increased bicarbonate ncentration and output and decreased the bile salt concenation. Continuous infusion of 0.08 mg/kg/hr histamine with dium taurocholate for 6 hr caused a sustained increase in bile ow. It is concluded that histamine causes a choleresis charterized mainly by the addition of a bicarbonate-rich fluid to e bile.

20 **MECHANISM OF METHIONINE BIOSYNTHESIS IN RAT LIVER.** *(E.)* Burton, E. (Dept. ochem., Case Western Reserve U., Cleveland, Ohio) and W. kami. *Europ J Biochem* 7(1):1-4, 1968.

The possible synthesis of methionine by a B_{12}-independent N^5-methyltetrahydropteroyltriglutamate:homocysteine methyltransferase was investigated *in vitro* in livers from male Wistar rats. In agreement with the work of others, it was found that methionine was formed by a crude liver supernatant fraction and dialyzed mitochondrial extract on aerobic incubation with N^5-methyltetrahydropteroyltriglutamate, homocysteine, and magnesium chloride. However, the folate derivative could not have been involved in this process since ^{14}C from N^5-[^{14}C]-methyl-tetrahydropteroyltriglutamate was not incorporated into methionine. In the supernatant fraction, methionine was formed by the transmethylation of endogenous betaine with added homocysteine. The rat liver supernatant fraction was found to contain 250 nM/ml betaine. In the mitochondrial extract, methionine formation occurred by proteolysis. It is concluded that a B_{12}-independent N^5-methyltetrahydropteroyltriglutamate:homocysteine methyltransferase does not occur in rat liver.

121 **LIPID METABOLITES OF CARBON TETRACHLORIDE.** *(E.)* Gordis, E. (Rockefeller U., New York, N. Y.). *J Clin Invest* 48(1):203-209, 1969.

Male Sprague-Dawley rats received ^{14}C- or ^{36}Cl-carbon tetrachloride i.v. and liver slices were examined for labeled lipids at varying time intervals after injection. Liver lipids were found labeled as early as 5 min after injection; most of the radioactivity being in the phospholipid fraction. The metabolites were shown to comprise a heterogeneous group of branched, long-chain, chlorinated fatty acids, probably containing the trichloromethyl side chain. Surviving liver slices also formed these metabolites *in vitro*. In a chemical system which generated trichloromethyl free-radicals, carbon tetrachloride added to methyl oleate formed esters which behaved like the metabolites during counter-current distribution and urea adduction. This evidence suggests the formation of these metabolites by free-radical attack on unsaturated lipids during CCl_4 intoxication.

122 **TISSUE CHOLESTEROL CONCENTRATION IN THE HYPERCHOLESTEROLEMIC RHESUS MONKEY.** *(E.)* Armstrong, M. L. (Dept. Med., U. Iowa, Iowa City), W. E. Connor and E. D. Warner. *Arch Path* 87(1): 87-92, 1969.

Seventeen adult male rhesus monkeys of average weight (8.60 ± 0.54 kg) were fed a low-fat, cholesterol-free diet for 6 weeks; 7 animals continued on this diet and served as controls, and 10 animals were then given a diet containing 1.2% cholesterol and 41% total calories from egg yolk fat. Fasting blood samples for serum lipid analysis were taken at 2-4 week intervals throughout the 17-month period, at which time all animals were sacrificed. Tissue specimens were obtained from matching sites in both groups. Statistically significant higher mean values were found in the hypercholesteremic animals in samples from some viscera and from skeletal muscle, fat, and skin. Plasma cholesterol levels were 782 ± 77 and 153 ± 10 mg/100 ml, resp. Liver cholesterol was 38.4 and 8.5 mg/g, resp., and the total content of the blood and liver together was 5.18 and 1.42 g/monkey. The increases in tissue cholesterol were nonuniform and probably reflect diverse modes of cholesterol accumulation. It seems, however, that the liver and blood cholesterol levels represent a constantly equilibrated primary cholesterol pool.

123 **THE EFFECT OF A HIGH-FAT DIET ON THE CHEMICAL COMPOSITION OF GALLBLADDER**

BILE IN DOGS. *(Rus.)* Narodetskaia, R. V. (Inst. Nutrit., Acad. Med. Sci. USSR, Moscow) and M. F. Nesterin. *Vop Pitan* 27(5):46-50, 1968.

The chemical composition of the bile was compared in dogs fed a well-balanced diet in which the caloric intake consisted of 18% protein, 20% fat, and 52% carbohydrate; those fed a high-fat diet (18% protein, 60% beef fat); and those fed a low-protein, high-fat diet (8% protein, 60% beef fat). A piece of the small intestine was sutured into the gallbladder to obtain bile. Increasing the fat content of the diet reduced lipid, bile acid, and phospholipid concentrations and increased cholesterol concentrations. An albumin fraction and a flocculent precipitate appeared which were not present in the bile of dogs on a well-balanced diet. These changes were even more marked in animals on a high-fat, low-protein diet. These changes were also seen in bile obtained from the liver. The composition of the bile was unchanged by direct injection of inactive pancreatic juice, activated pancreatic juice, gastric juice, or an aqueous suspension of feces into the gallbladder.

124 **INFLUENCE OF CARBON TETRACHLORIDE, VITAMIN E AND PROTEIN UPON LIVER SLICE RESPIRATORY ACTIVITY.** *(E.)* Blendermann, E. M. (FDA, U. S. Dept. HEW, Washington, D. C.) and L. Friedman. *Proc Soc Exp Biol Med* 129(3):831-836, 1968.

Weanling male albino rats of the Osborne-Mendel strain were maintained for 5 weeks on a purified diet containing 18% or 10% casein with or without vitamin E in order to study the effect of vitamin E deficiency and low protein intake on CCl_4-induced alterations of hepatic carbohydrate metabolism. After a 24-hr fast, the rats were intubated orally with 1 ml of CCl_4 in olive oil per kg body weight and then fasted for another 24 hr. Although mortality was reduced by adequate dietary protein and/or vitamin E, other parameters of CCl_4–altered carbohydrate metabolism were unaffected by lowering dietary casein or vitamin E levels. These included: increased liver size and fat content, lowered oxygen uptake and increased production of $^{14}CO_2$ from uniformly labeled glucose-^{14}C by liver slices, and a net production of lactic acid (seen only with liver slices from CCl_4-dosed rats). The protective effect of dietary vitamin E and protein against CCl_4 toxicity is therefore unrelated to any effects on carbohydrate metabolism.

125 **THE EFFECT OF STARVATION ON LIVER REGENERATION IN RATS AFTER PARTIAL HEPATECTOMY.** *(E.)* Doyle, M. (Dept. Physiol., U. Toronto, Canada), R. B. Wilson and W. S. Hartroft. *Exp Molec Path* 9(3):400-404, 1968.

Liver regeneration was investigated in starved and fed rats 72 hr after partial hepatectomy. The weights of the regenerated livers were expressed both as a percentage of the preoperative liver weights and as a percentage of the liver weights of unoperated rats subjected to either starvation or feeding. This conformed to the method of Doljanski (*Exp. Molec. Path.* 5:263-272, 1966), with the exception that 2 types of fed controls were used, one being fed *ad libitum* and the other being pair-fed with operated rats fed *ad libitum.* Food consumption and body weights were significantly greater in the control rats fed *ad libitum* than in the operated rats. The weights of the regenerated livers in fed rats were similar to those in starved animals when expressed as a percentage of the liver weights of unoperated rats fed *ad libitum.* However, when expressed as a percentage of those of pair-fed controls, they were found to be significantly greater in fed animals as compared to starved rats. Thus, starvation retards liver regeneration in partially hepatectomized rats.

126 **PROTECTION BY OROTIC ACID AGAINST THE RENAL NECROSIS AND FATTY LIVER OF CHOLINE DEFICIENCY.** *(E.)* Simon, J. B. (Yale U. Sch. Med., New Haven, Conn.), R. Scheig and G. Klatskin. *Proc Soc Exp Biol Med* 129(3):874-877, 1968.

The effect of orotic acid and adenine sulfate on hepatic fat accumulation and the incidence of renal lesions in choline deficiency was studied in male weanling Sprague-Dawley rats. The addition of 1% orotic acid to a choline-deficient diet lowered the incidence of hemorrhagic renal necrosis in young rats from 86% to 41%, and within 24 hr reduced the accumulation of hepatic triglycerides by almost 50%. Simultaneous supplementation of the diet with 0.25% adenine sulfate did not influence these protective effects of orotic acid. It is suggested that orotic acid may act to lower the requirement of the body for choline through a metabolic interaction.

127 **EFFECTS OF A SHORT-TERM FAST ON ALBUMIN SYNTHESIS STUDIED *IN VIVO*, IN THE PERFUSED LIVER, AND ON AMINO ACID INCORPORATION BY HEPATIC MICROSOMES.** *(E.)* Rothschild, M. A. (New York U. Sch. Med., N. Y.), M. Oratz, J. Mongelli and S. S. Schreiber. *J Clin Invest* 47(12):2591-2599, 1968.

Carbonate-^{14}C, leucine-^{3}H and phenylalanine-^{14}C were used to study albumin synthesis *in vivo* and in the perfused rabbit liver, and to determine the rate of amino acid incorporation by hepatic microsomes isolated from livers taken from either fed or fasted rabbits and from isolated perfused livers the donors of which had been either fed or fasted. Albumin synthesis was rapidly inhibited by fasting, being decreased 33% *in vivo* and 53% in the perfused liver. The microsomes from perfused livers taken from fed animals did not demonstrate a significantly reduced capacity to incorporate leucine-^{3}H or phenylalanine-^{14}C into protein, but microsomes derived from either perfused or nonperfused livers the donors of which had been fasted incorporated 32-54% less tracer than microsomes obtained from fed donor rabbits. Microsomes isolated from perfused livers removed from fed or fasted rabbits responded equally to polyuridylic acid stimulation and phenylalanine-^{14}C incorporation rose by 58-171%. An 18-36 hr fast thus inhibits albumin production both *in vivo* and in the perfused liver; the microsomal system is less active in the fasted state, but perfusion *per se* does not inhibit the microsomal response.

128 **LOW PLASMA-BILIRUBIN IN EPILEPTICS ON PHENOBARBITONE.** *(E.)* Thompson, R. P. H. (King's Coll. Hosp., London, England), A. L. W. F. Eddleston and R. Williams. *Lancet* 1(7584):21-22, 1969.

The long-term effect of phenobarbitone on plasma bilirubin levels was studied in 38 epileptics, using a modification of Michaelsson's method which allowed more accurate measurement of low levels. All epileptics were taking phenobarbitone (30-270 mg/day) and some also received other anti-epileptic drugs. The range of plasma bilirubin in the control females and in those taking oral contraceptives was similar, 0.39 and

.34 mg/100 ml, resp. The mean level of 0.38 mg/100 ml in
hese 19 control females was lower than the 0.47 mg/100 ml
ound in the 21 males, but this difference was not significant.
'he plasma bilirubin levels were lower in the epileptics, 0.20
ıg/100 ml for males and 0.17 mg/100 ml for females, and the
ifference between the control and epileptic means was highly
gnificant for both sexes. The highest epileptic levels recorded
'ere 0.43 mg/100 ml for males, and 0.37 mg/100 ml for fe-
ıales, compared with the control maxima of 0.80 and 0.99
ıg/100 ml, resp. The significant reduction in bilirubin levels
the epileptics could be explained by the persistent induction
f glucuronyl transferase or by increased excretion of bilirubin
om the hepatic cell.

29 THE ROLE OF THE LIVER IN ANGIOTENSINOGEN PRODUCTION. *(E.)* Dévényi, I.
J. Med. Sci., Debrecen, Hungary), G. Dauda and Z. Nemes.
cta Physiol Acad Sci Hung 34(1/2):43-46, 1968.

ubtotal hepatectomy was performed on 20 female Wistar rats
40-160 g); in 7 of these rats, bilateral nephrectomy was per-
ırmed 56 hr later, while 30 other rats had bilateral nephrect-
ny alone. In the partially hepatectomized rats, normal values
angiotensinogen were found 24 (7 rats) and 72 (6 rats) hrs
ter operation. Sixteen hr after bilateral nephrectomy, angio-
nsinogen levels increased 10-fold both in the 30 control rats
d in the 7 rats that had been partially hepatectomized 56 hr
evious to nephrectomy. These results indicate that the liver
not involved in the formation of angiotensinogen.

**0 EFFECT OF ELEVATED LEVELS OF STEROID HORMONES ON INTACT AND REGENERA-
NG RAT LIVER STEROIDS AND LIVER REGENERATION.**
.) Gershbein, L. L. (Northwest Inst. Med. Res., Chicago,
). *Acta Hepatosplen* 15(6):409-414, 1968.

ıle and female Holtzman rats received daily s.c. injections
various steroids in peanut oil for 7 days and were sacrificed
days after the 1st injection; at this time, the livers were
noved and examined histologically and the glycogen, water
l total lipid content were determined. Another group of
les, previously ovariectomized mature and immature females,
l sham-operated controls underwent 2/3 partial hepatectomy
or to the same protocol as in the 1st group. The extent of
er regeneration was calculated from the dry weight removed
partial hepatectomy and the dry weight at necropsy. Adult
nales showed significant increases in both unit wet and dry
r weights as compared to the controls when given proges-
one (580 mg/kg), testosterone propionate (2400 mg/kg),
radiol benzoate (10.7 mg/kg) or progesterone (615 mg/kg)
s estradiol benzoate (10.8 mg/kg). The water content was
rated in each case except for the rats on progesterone; gly-
en and total lipids showed no change over controls. In
trast, adult males administered progesterone (570 mg/kg),
osterone propionate (2560 mg/kg) or estradiol benzoate
.8 mg/kg) showed little change in relative liver weights. In
partially hepatectomized rats, progesterone (2000 mg/kg)
kedly stimulated liver regeneration in males but, as also
erved in females, the effect was completely antagonized by
adiol benzoate. Testosterone (2600-3000 mg/kg) accelerated
process of liver regeneration in intact females of those ova-
tomized during maturity 43 days prior to partial hepatectomy
not in rats gonadectomized while immature 51 days before
surgery . Histological examination of biopsies from intact
and partially hepatectomized rats revealed no significant alterations as compared to their respective controls.

131 HEPATIC DRUG-METABOLISING ENZYME ACTIVITY AND DURATION OF HEXOBARBITONE ANAESTHESIA IN BARBITONE-DEPENDENT AND WITHDRAWN RATS. *(E.)* Stevenson, I. H. (Dept. Pharmacol. Ther., U. Dundee, Scotland) and M. J. Turnbull. *Biochem Pharmacol* 17(11):2297-2305, 1968.

In a study of the effect of barbiturate dependence and withdrawal on hepatic drug metabolism, female Wistar rats were made dependent on barbitone sodium by the administration of increasing amounts in the drinking water over a 32-day period. Abrupt withdrawal was accompanied by a characteristic withdrawal syndrome. The body weight, liver weight, and body/liver weight ratio increased during barbitone treatment and fell after withdrawal. The liver protein and glycogen content did not change during barbitone treatment. Withdrawal produced a transient reduction in hepatic glycogen content but did not affect protein levels. The capacity of hepatic microsomal preparations to metabolize hexobarbitone, aminopyrine and prontosil and to conjugate o-aminophenol was increased by barbitone treatment. Following withdrawal, the enzyme activity fell below that of control animals, and 4 months after withdrawal the liver enzyme activity was still subnormal. Administration of phenobarbitone to rats 4 months after withdrawal restimulated hepatic microsomal drug-metabolizing enzymes but the level attained was not as high as that found in phenobarbitone-treated control rats. The same degree of tolerance to injected hexobarbitone, as indicated by reduction in sleeping time, was found at all stages of barbitone treatment. A hypersensitivity to hexobarbitone was produced by withdrawal. It is concluded that both the tolerance in barbitone-dependent rats and the hypersensitivity of withdrawn animals can be adequately explained by altered activity of the hepatic drug-metabolizing enzymes.

132 INTRACELLULAR CATABOLISM OF HEMOGLOBIN AND IRON DEXTRAN BY THE RAT LIVER. *(E.)* Kornfeld, S. (Washington U. Sch. Med., St. Louis, Mo.), B. Chipman and E. B. Brown. *J Lab Clin Med* 73(2): 181-193, 1969.

To investigate the intracellular site of hemoglobin digestion by the liver, hemoglobin labeled with ^{59}Fe in the heme moiety and with ^{75}Se-selenomethionine in the globin moiety was injected i.v. into Sprague-Dawley rats; at intervals (10 min-5 days), their livers were removed and fractionated by differential centrifugation into nuclear, mitochondrial, lysosomal, microsomal and supernatant fractions. A high percentage of ^{59}Fe and ^{75}Se appeared in the lysosomal and microsomal fractions at 10 min, but by 40 min there was a significant shift to the lysosomes. During the next 4 hr the radioactivity progressively shifted from these particulate fractions to the supernatant. By 3 hr nearly all of the ^{59}Fe in the supernatant was in the form of ferritin, while that in the particulate fractions was in heme form. Studies of acid phosphatase and ^{75}Se release from particulate fractions and sucrose gradient experiments indicated that a heterogeneous group of particles, both lysosomal and nonlysosomal (but not microsomal), were capable of degrading hemoglobin into small peptides. In rats treated with turpentine to produce sterile abscesses, most of the ^{59}Fe accumulation (nonheme form) occurred in the supernatant, suggesting that the block in Fe reutilization in chronic inflammation is not at the stage of hemoglobin degradation but in the release of nonheme iron from the cell. ^{59}Fe-Imferon (iron dextran) injected i.v. was initially found primarily in the supernatant, but over the next 4 hr the labelling shifted to the particulate fractions, sucrose gradient studies demonstrated that the Imferon primarily entered the lysosomes.

133 **INFLUENCE OF BILE ACIDS ON BILIARY LIPID EXCRETION IN MAN: IMPLICATIONS IN GALLSTONE FORMATION.** *(E.)* Swell, L. (VA Hosp., Richmond, Virginia) and C. C. Bell Jr. *Amer J Dig Dis* 13(12): 1077-1080, 1968.

The lipid composition of human bile in response to orally administered bile salts was investigated in a 51-yr-old cholecystectomized white male with a short-arm T-tube in his common bile duct. Following the oral administration of a bile-acid preparation (Bilron) 3 times a day for 2 days (1.8 g/day), starting 8 days after surgery, large increases in the concentrations of biliary bile acid (13.3-28.6 mM), phospholipid (4.1-7.5 mM) and cholesterol (2.2-4.0 mM) were observed. The bile acid and phospholipid levels increased more than the cholesterol level, yielding an increase in the phospholipid/cholesterol ratio from 1.4 to 1.9. When the oral bile salts were stopped for 2 days, the concentration of biliary bile acids and phospholipids decreased and the phospholipid/cholesterol ratio declined to 1.5. Upon resuming the oral bile acids at a daily dosage of 1.8, 2.2 and 2.9 g for the next 3 days, the concentrations of biliary bile acid and phospholipid increased significantly while the cholesterol concentration rose slightly. By the third day of increased bile salt administration, the phospholipid/cholesterol ratio had increased to 2.6, representing an 85% increase over the control period.

134 **DRUG METABOLISM IN HYPOTHERMIA. UPTAKE, METABOLISM AND EXCRETION OF C^{14}-PROCAINE BY THE ISOLATED, PERFUSED RAT LIVER.** *(E.)* Kalser, S. C. (Sch. Med., U. Pittsburgh, Pa.), E. J. Kelvington, R. Kunig and M. M. Randolph. *J Pharmacol Exp Ther* 164(2):396-404, 1968.

The effect of hypothermia on the process of hydrolysis was studied in the isolated perfused rat liver using ^{14}C-labeled procaine as the prototype drug. The initial rate of uptake by the liver decreased with decreasing temperature. Under euthermic conditions the rate of procaine hydrolysis approximated its rate of liver uptake, but in hypothermia hydrolysis was slower than uptake. Further metabolism of the hydrolysis products was indicated by the appearance of at least 4 metabolites, in addition to procaine, in the bile. The label from the administered ^{14}C-procaine showed a bile/blood concentration ratio of 30. The excretion of ^{14}C into the bile was temperature dependent; maximum concentrations were reached more slowly, final concentrations were lower and the percentage of the injected dose excreted in 4 hr was less under hypothermic conditions.

135 **RESPIRATORY GAS TENSIONS OF HUMAN AND DOG GALLBLADDER BILE.** *(Kor.)* Ryo, U. Y. (Sch. Med., Kyungpook Natl. U., Korea), K. J. Kim, W. P. Chung and Y. S. Kwak. *J Korean Med Ass* 11(9):71-74, 1968.

The respiratory gas tensions and pH of gallbladder bile from 7 patients undergoing diagnostic laparotomy or appendectomy and 15 dogs were determined. Partial pressures were calculated from the O_2 and CO_2 content determined by a Van Slyke manometric apparatus, and the pH was measured by a Beckman pH meter. In humans, the average content and partial pressure of O_2 were 1.38 vol % and 58.7 mm Hg, resp., and those of CO_2 were 42.6 vol % and 81.9 mm Hg, resp. The average pH was 7.13. The comparatively higher CO_2 content of bile than that found in surrounding tissue was attributed to the bicarbonate content of the bile. The lower than expected pH was attributed to preoperative fasting. In dogs, the average content and partial pressure of O_2 was 0.39 vol % and 16.6 mm Hg, resp., and those of CO_2 were 18.3 vol % and 35.2 mm Hg, resp. The average pH was 6.66. The significantly lower values found in dogs as compared to humans was attributed to hypoxic-ventilation during the experiment.

136 **ACTION OF AMOBARBITAL ON MICROSOMAL AND MITOCHONDRIAL RESPIRATORY STATE IN PERFUSED RAT LIVER WITH AND WITHOUT PHENOBARBITAL INDUCTION.** *(E.)* Brauser, B. (Inst. Physiol. Chem., U. Munich, Germany), H. Sies and T. Bücher. *FEBS Letters* 2(3):170-172, 1969.

The interactions between mitochondrial respiration and microsomal hydroxylation were investigated in perfused rat liver by comparing the effects of amobarbital with those of aminopyrine (which acts only on the microsomes), and by inducing microsomal hydroxylation with repeated injections of phenobarbital (0.05 g/kg/day, i.p.). In the noninduced perfused liver, 0.2 mM aminopyrine produced a 6% increase in respiratory rate and a small increase in optical density (450-463 nm). When mitochondrial pigments were followed with the dual wavelength technique, no redox change was found after aminopyrine addition, but 0.2 mM amobarbital did produce such changes. This concentration of amobarbital also decreased the respiratory rate by 12%. Following phenobarbital induction, aminopyrine addition resulted in a respiratory increase which correlated with the number of phenobarbital injections. The ratio cytochrome P-450/cytochrome (a+a$_3$) rose after induction with phenobarbital. No exact correlation was found between respiratory increment and the P-450/(a+a$_3$) ratio; this suggests an influence of additional factors on microsomal activity. Overall respiration increased about 8% with 0.2 mM amobarbital as substrate 1 day after a single phenobarbital injection, indicating that the mitochondrial site of action is no longer accessible to the amobarbital after a single dose of inducing agent. It then appears to act solely as a microsomal substrate.

137 **STUDIES ON GLUTAMIC OXALACETIC TRANSAMINASE IN THE RAT. III. HORMONA CONTROL OF ISOENZYME LEVELS IN LIVER BY THE PITUITARY-ADRENAL SYSTEM.** *(E.)* Ogawa, Y. (Shionogi Res. Lab., Shionogi & Co., Ltd., Japan), Y. Kometani and Y. Baba. *Chem Pharm Bull* 16(10):1948-1952, 1968.

Hormonal induction of soluble and mitochondrial glutamic oxaloacetic transaminase (s-GOT and m-GOT, resp.) was studied in liver homogenates of Wistar rats, using the authors' procedure for estimation of isoenzyme activities (*Chem. Pharm. Bull.* 16: 1937, 1968.). Cortisone or corticosterone (25 mg/kg/day x 4, s.c.), suspended in either water or sesame oil, increased s-GOT

tivity in both intact and adrenalectomized rats. However,
-GOT activity was depressed in intact or adrenalectomized
nimals only when the vehicle was sesame oil. Administration
low doses of ACTH (10 IU/kg/day x 3, s.c.) resulted in no
servable effects on liver isoenzyme or SGOT activities in
tact rats, but effects were noted in hypophysectomized ani-
als (increased s-GOT and SGOT activities, decreased m-GOT
tivity). Even at high doses of ACTH (20 IU/kg t.i.d. for 1
3 days) no changes occurred in enzyme activities in adrenal-
tomized rats. Epinephrine and norepinephrine and dihydroxy-
enylalanine (DOPA; 0.5 mg/kg 4 times every hr, s.c.) pro-
ced an increase in s-GOT activity in intact rats. Only epin-
hrine and norepinephrine resulted in increased SGOT activity
ter 4 hr. A slight decrease was observed in m-GOT activity
hr after administration of epinephrine, norepinephrine or
PA, and this effect was enhanced, in the case of epinephrine,
cortisone-pretreated adrenalectomized animals. These data
ggest that the pituitary-adrenal hormones may play a role
the regulation of liver GOT isoenzymes.

**8 ZONAL ELECTROPHORESIS OF THE SOLUBLE
NUCLEAR PROTEINS OF NORMAL AND PRE-
OPLASTIC LIVERS.** *(E.)* Bakay, B. (Inst. Cancer Res.,
x Chase, Philadelphia, Pa.) and S. Sorof. *Cancer Res* 29(1):
-27, 1969.

adult male rats (CFN strain) fed stock, control, or hepato-
cinogenic (3'-methyl-4-dimethylaminoazobenzene) diets for
days, the saline-soluble proteins of liver nuclei (isolated in
M sucrose solution from the perfused livers) were resolved
o profiles according to charge, permitting comparison with
ilar arrays from liver cytoplasm. Nuclei were found to con-
n 3% of the bound azo dyes in the liver. Extraction of the
clei in isotonic saline-phosphate buffer at pH 7.4 dissolved
roximately 49% of the nitrogen and 86% of the protein-
ind dyes. Fifteen classes of the soluble nuclear macromole-
es were isolated by column zonal electrophoresis. The
ngly acidic, weakly acidic, and near-neutral classes were
nd to consist of proteins. In contrast, the basic classes
e composed of small molecules, apparently dissociated from
macromolecules. Approximately half of the protein-bound
s were associated with a small class of near-neutral proteins,
h the remainder combined mainly with the acidic proteins.
saline-soluble proteins appeared to be similar to those of
cytoplasm, particularly the principal near-neutral azoproteins
he nucleus and the cytoplasm. It is felt that these soluble
cromolecules may be shared throughout the 'soluble space'
he liver cell.

**SYSTEMATIC OSCILLATIONS IN METABOLIC
ACTIVITY IN RAT LIVER AND HEPATOMAS.
RVEY OF NORMAL DIPLOID AND OTHER HEPATOMA
ES.** *(E.)* Potter, V. R. (Med. Ctr., U. Wisconsin, Madison),
Watanabe, H. C. Pitot and H. P. Morris. *Cancer Res* 29(1):
78, 1969.

diploid Morris hepatomas transplanted into male or female
falo strain rats and 3 other Morris hepatomas transplanted
male or female ACI rats were assayed under controlled
ary and feeding regimens for certain enzymes known to
w marked variations in activity in normal liver. Tyrosine
saminase activity in normal rat liver showed wide variations
ending on the protein content of the diet and the feeding
pattern, with a sharp maximum 6 hr after the beginning of the feeding period. The activities in the various hepatomas ranged from almost zero to values exceeding that in normal liver; however, in most cases the activities were unresponsive to dietary protein and the amplitude of the daily variation was less than in normal liver. Serine dehydratase activity in normal rat liver also showed wide variations depending on the protein content of the diet, but was only minimally affected by various feeding patterns. The activities in the various hepatomas varied from almost zero in the 6 diploid strains to higher than normal levels in one of the others. In 3 of the hepatomas, the tyrosine transaminase and serine dehydratase activities were unaffected by variations in the protein content of the diet. A significant decrease in the serine dehydratase activity of the host liver was noted with several of the hepatoma strains.

140 CHANGES IN ORNITHINE CARBAMOYL TRANSFERASE ACTIVITY IN SERUM AND IN LIVER AFTER PARTIAL HEPATECTOMY IN RATS. *(E.)* Bengmark, S. (Sahlgren Hosp., U. Göteborg, Sweden), L. Engevik and R. Olsson. *Scand J Gastroent* 3(3):264-266, 1968.

In partially hepatectomized male Sprague-Dawley rats, the activity of the highly specific liver enzyme ornithine carbamoyl transferase (OCT) in serum and liver tissue was compared with the activity of glutamic pyruvic transaminase (GPT). Determinations were made from 1 day to 9 months after operation. Serum OCT activity was elevated for 2-3 weeks before gradually returning to normal; liver OCT activity was decreased for up to 3 months but normal at 9 months. Serum GPT activity was only elevated for 2 days and liver GPT activity was decreased for only 4 weeks before returning to normal values.

141 STUDIES ON THE INDUCTION AND REPRESSION OF ENZYMES IN THE LIVER. I. EFFECT OF HUNGER, ALLOXAN DIABETES AND ADRENALECTOMY ON SOME ENZYMES INVOLVED IN AMINO ACID METABOLISM AND GLYCOLYSIS. *(Ger.)* Schmidinger, H. (Med. Clin., U. Tübingen, Germany), E. Musch and H. F. von Oldershausen. *Klin Wschr* 47(1):36-38, 1969.

The GOT activity in the livers of rats fed a low-protein diet increased after they were fasted for 38 hr. Liver GOT activities were even higher in fasted rats which had been adrenalectomized. Administration of glucose to fasted rats did not depress the GOT activity. Alloxan diabetes produced a significant increase in the activities of GOT, GPT, and serine dehydratase in the liver. This effect on GOT and serine dehydratase activities was increased by starvation, but starvation produced a slight decrease in the GPT activity. Glucokinase activities were decreased in alloxan diabetes and starvation. These results may have important implications for metabolism in human diabetes mellitus and dietary deficiencies.

142 C^{14}-GLUCOSE INCORPORATION INTO GLYCOGEN BY PIGEON LIVER HOMOGENATE. *(E.)* Figueroa, E. (Sch. Med., U. Chile, Santiago) and P. Vega. *Acta Physiol Lat Amer* 18(3):231-241, 1968.

143 DEVELOPMENT OF THE GLYCOLYTIC ENZYMES OF THE LIVER DURING THE

PERINATAL PERIOD IN THE RAT. *(Fr.)* Roux, J. M. (Port-Royal Hosp., Paris, France) and C. Tordet-Caridroit. *C R Soc Biol (Paris)* 162(3):675-679, 1968.

144 HEPATIC REGENERATION: EFFECT OF SIZE OF RESECTION ON *IN VITRO* GROWTH OF REMNANT LIVER CELLS. *(E.)* Hays, D. M. (U. Southern California, Los Angeles), I. Tedo, S. Okumura and K. Nagashima. *Nature* 220(5164):286-287, 1968.

145 AN EXPERIMENTAL STUDY OF THE PROCESSES OF REGENERATION FOLLOWING EXTENSIVE HEPATECTOMY. *(Fr.)* Mallet-Guy, P. (Ed. Herriot Hosp., Lyon, France) and N. Chaneliere. *Bull Soc. Int Chir* 27(4):268-274, 1968.

146 THE EFFECT OF CARBON TETRACHLORIDE ON THE KINETICS OF BROMSULPHALEIN CLEARANCE IN THE RABBIT. *(E.)* Rolla, A. (U. Turin, Italy) and G. Segre. *Europ J Pharmacol* 3(4):330-336, 1968.

147 THE EFFECT OF ETHANOL ON THE CONCENTRATIONS OF ADENINE NUCLEOTIDES IN RAT LIVER. *(E.)* Thieden, H. I. D. (U. Copenhagen, Denmark). *FEBS Letters* 2(2):121-123, 1968.

148 BILIARY EXCRETION OF PROBENECID AND ITS GLUCURONIDE. *(E.)* Guarino, A.M. (Nat. Inst. Hlth., Bethesda, Md.) and L. S. Schanker. *J Pharmacol Exp Ther* 164(2):387-395, 1968.

149 STUDIES ON DRUG METABOLISM. II. CHANGES OF SLEEPING TIME, LIVER MICROSOMAL DRUG METABOLIZING ENZYME ACTIVITY AND ACCUMULATION TO VARIOUS ORGANS BY LONG TERM ADMINISTRATION (1 MONTH) OF PENTOBARBITAL IN CATS. *(E.)* Kitagawa, H. (U. Chiba, Japan), S. Yoshida, and T. Kamataki. *J Pharm Soc Japan* 88(8):954-957, 1968.

150 STUDIES ON DRUG METABOLISM. III. EFFECT OF LONG TERM ADMINISTRATION OF AMINOPYRINE AND SULPYRINE ON LIVER MICROSOMAL DRUG METABOLIZING ENZYME ACTIVITIES IN RATS. *(E.)* Kitagawa, H. (U. Chiba, Japan), S. Yoshida and T. Kamataki. *J Pharm Soc Jap* 88(8):958-963, 1968.

151 VITAMIN A DEFICIENCY AND PHOSPHOLIPID METABOLISM. *(E.)* Krause, R. F. (West Virginia U. Med. Ctr., Morgantown), K. C. Beamer and C. Lawrence. *Amer J Clin Nutr* 22(1):27-32, 1969.

152 TRYPTOPHAN OXYGENASE ACTIVATION AND ASCORBATE OXIDATION IN WHOLE HOMOGENATES FROM RAT LIVER. *(E.)* Seglen, P. O. (Dept. Pharmacol., U. Oslo, Norway) and K. F. Jervell. *Biochim Biophys Acta* 171(1):47-57, 1969.

153 EFFECT OF RETINOL FEEDING ON LIVER CHOLESTEROL OF RATS. *(E.)* Misra, U. K. (Dept. Biochem., U. Delhi, India). *J Vitamin (Kyoto)* 14(4):312-315, 1968.

154 THE ROLE OF GLUCOSE, GLUCAGON AND GLUCOCORTICOIDS IN THE REGULATION OF LIVER GLYCOGEN SYNTHESIS. *(E.)* DeWulf, H. (Lab. Chem., U. Louvain, Belgium) and H. G. Hers. *Europ J Biochem* 6(4):558-564, 1968.

155 STUDIES ON LIVER AGRINASE IN MICE WITH EHRLICH CARCINOMA. *(E.)* Abreu, L. A. (Inst. Oswaldo Cruz, Rio de Janeiro, Brazil) and R. R. Abreu. *Hospital (Rio)* 73(4):1287-1290, 1968.

156 ON THE PROBLEM OF POSSIBLE OTHER FORMS OF CYTOCHROME P$_{450}$ IN LIVER MICROSOMES. *(E.)* Schenkman, J. R. (Inst. Toxicol., U. Tubingen, Germany), H. Greim, M. Zange and H. Remmer *Biochim Biophys Acta* 171(1): 23-31, 1969.

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161 THE INCORPORATION OF ^{14}C PALMITATE INTO GLYCERIDES AND PHOSPHOLIPIDS OF LIVER HOMOGENATES FROM FED AND STARVED RATS. *(E.)* Vavrecka, M. (Dept. Biochem., U. Birmingham, England), M. P. Mitchell and G. Hubscher. *Biochem J* 110(4):52P, 1968.

162 INCREASED HYPERCHROMIC EFFECT OF ADRENALINE ON RAT-LIVER RNA. *(E.)* Decallonne, J. (Dept. Biol. Chem., U. Louvain, Belgium), R. Leblus an A. Wiaux. *Acta Physiol Acad Sci Hung* 34(1-2):129-130, 1968

163 RECENT ADVANCES IN BILE PIGMENT METABOLISM. *(E.)* Lester, R. (Boston U. Sch. Med. Mass.) and R. F. Troxler. *Gastroenterology* 56(1):143-169, 196

164 ISOLATION OF A NOVEL SULPHATASE FROM RAT LIVER *(E.)* Tudball, N. (Duke U. Med. Ctr., Durham, N. C.) and E. A. Davidson. *Biochim Biophys Acta* 171(1):113-120, 1969.

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166 **THE EFFECT OF 4-PENTENOIC ACID ON FATTY ACID OXIDATION.** *(E.)* Brendel, K. (Duke U. Med. Ctr., Durham, N. C.), C. F. Corredor and R. Bressler *Biochim Biophys Acta* 34(3):340-347, 1969.

167 **D-β-AMINOISOBUTYRATE: PYRUVATE AMINOTRANSFERASE IN MAMMALIAN LIVER AND EXCRETION OF β-AMINOISOBUTYRATE BY MAN.** *(E.)* Kakimoto, Y. (Osaka U. Med. Sch., Japan), K. Taniguchi and I. Sano. *J Biol Chem* 244(2):335-340, 1969.

168 **AN HEPATIC INHIBITOR OF ACTIVATED CLOTTING FACTOR X (STUART).** *(E.)* Deykin, D. (Harvard Med. Sch., Boston, Mass.), F. Cochios and D. Mosher. *Biochem Biophys Res Commun* 34(2):245-251, 1969.

169 **DIGESTIVE ACTIVITY OF LYSOSOMES. III. THE DIGESTION OF LIPIDS BY EXTRACTS OF RAT LIVER LYSOSOMES.** *(E.)* Fowler, S. (Rockefeller U., New York, N.Y.) and C. DeDuve. *J Biol Chem* 244(2):471-481, 1969.

170 **MODIFICATION BY 8-AZAGUANINE OF THE EFFECTS OF HYDROCORTISONE ON THE INDUCTION AND INACTIVATION OF TYROSINE TRANSAMINASE OF RAT LIVER.** *(E.)* Levitan, I. B. (McGill U. Res. Unit, Montreal, P. Q., Canada) and T. E. Webb. *J Biol Chem* 244 (2):341-347, 1969.

71 **THE *IN VITRO* CARABOLISM OF CHOLESTEROL: A COMPARISON OF THE FORMATION OF 26-HYDROXYCHOLESTEROL AND CHENODEOXYCHOLIC ACID FROM CHOLESTEROL IN RAT LIVER.** *(E.)* Mendelsohn, D. (Witwatersrand U. Med. Sch., Johannesburg, South Africa) and L. Mendelsohn. *Biochemistry* 7(12):4167-4172, 1968.

172 **THE ROLE OF LIPID PEROXIDATION IN THE PATHOGENESIS OF CARBON TETRACHLORIDE-INDUCED LIVER INJURY.** *(E.)* Alpers, D. H. (Massachusetts Gen. Hosp., Boston), M. Solin and K. J. Isselbacher. *Molec Pharmacol* 4(6):566-573, 1968.

173 **STUDIES ON THE SYNTHESIS OF FATTY ACIDS IN HUMAN LIVER SLICES WITH THE AID OF GAS RADIOCHROMATOGRAPHY.** *(E.)* Blomstrand, R. (Dept. Clin. Chem., Karolinska Inst., Stockholm, Sweden), B. Holmstrom and B. Werner *Acta Chir Scand* 134(8):627-637, 1968.

174 **THE INFLUENCE OF INORGANIC PHOSPHATE, ADENOSINE TRIPHOSPHATE AND GLUCOSE-6-PHOSPHATE ON THE ACTIVITY OF LIVER GLYCOGEN SYNTHETASE.** *(E.)* DeWulf, H. (U. Louvain, Belgium), W. Stalmans and H. G. Hers. *Europ J Biochem* 6(4):545-551, 1968.

175 **HEPATIC CONTENT OF COENZYME Q IN RATS AFTER ADMINISTRATION OF VARIOUS COENZYME Q COMPOUNDS AND ^{14}C-LABELED COENZYME Q_7.** *(E.)* Shigeta, Y. (Osaka U. Med. Sch., Japan), K. Izumi and H. Abe. *J Vitamin (Kyoto)* 14(4):312-315, 1968.

176 **EFFECTS OF ETHANOL INFUSION ON THE REDOX STATE AND METABOLITE LEVELS IN RAT LIVER *IN VIVO*.** *(E.)* Rawat, A. K. (Biochem. Inst., U., Copenhagen, Denmark). *Europ J Biochem* 6(4):585-592, 1968.

See also: 12,16,64,226,434,436,481,691,702,740,768,769,770,777,786,788,789

177 **WEIGHT, FOOD INTAKE, AND BODY COMPOSITION: EFFECTS OF EXERCISE AND OF PROTEIN DEFICIENCY.** *(E.)* Crews, E. L. III (Washington U. Sch. Med., St. Louis, Mo.), K. W. Fuge, L. B. Oscai, J. O. Holloszy and R. E. Shank. *Amer J Physiol* 216(2):359-363, 1969.

The interacting effects of protein deficiency, exercise and caloric restriction on food intake, weight gain, and body composition were investigated in male Wistar rats. Rats were divided into 2 dietary groups [protein-deficient (8% casein) and normal protein], each of which was further subdivided into an exercised group and 2 sedentary groups (one fed *ad libitum* and one calorie restricted to maintain a weight equal to that of the exercised animals). Exercising animals gained less weight than free-eating sedentary controls as a result of both an increase in caloric expenditure and a decrease in food intake. Exercise resulted in a significant decrease in the percentage of body fat, with a proportional relative increase in lean body mass. Sedentary calorie-restricted animals had a higher fat content than exercising animals of the same weight, suggesting a specific fat-mobilizing effect of exercise. Rats on the low-protein diet were markedly stunted but otherwise appeared healthy and had a greater capacity for prolonged running than the rats on the normal protein diet. Protein deficiency resulted in a decrease in the percentage of body fat and an increase in the proportion of water. Because of the small size of the protein-deficient rats, total amounts of all body constituents were markedly decreased.

178 **THE EFFECT OF BILIRUBIN ON THE HUMAN PLATELET.** *(E.)* Suvansri, U. (Long Island Jewish Hosp., New Hyde Park, N. Y.), W. H. Cheung and A. Sawitsky. *J Pediat* 74(2):240-246, 1969.

Platelets obtained from the cord blood of 27 normal full-term infants, 8 normal premature infants, 12 full-term infants with elevated indirect serum bilirubin (12.1-18.1 mg%), and 7 premature infants with elevated indirect serum bilirubin (13.2-23.5 mg%) were incubated in saline (pH 7.7) and in 15, 20, and 25 mg% bilirubin solutions (pH 7.8) for 1 hr (23C). Platelet morphology was studied after 15 min, 1 and 3 hr of incubation, and platelet function was determined by the thromboplastin generation test (TGT) with platelets incubated for 1 hr (23C) in saline or solutions of varying bilirubin concentration. The ATP and ADP concentrations of platelets incubated for 1 hr in saline or various bilirubin solutions were also determined, as well as the effect of bilirubin on clot retraction of freshly shed normal adult whole blood. Platelet morphology was altered at bilirubin concentrations of 15 mg% or greater and consisted of platelet swelling and filamentous membrane formation frequently associated with platelet aggregation and cell lysis. Frequent and significant impairment of TGT occurred (11-16 sec) with bilirubin concentrations of 20 mg% or greater. Similar results were found with platelets from premature infants. Bilirubin had no effect on platelet ATP concentration, but did inhibit ADP-induced platelet factor 3 activation. Bilirubin added to normal whole blood caused poor to absent clot retraction. It is suggested that the abnormalities in platelet morphology and function are related to an inhibitory effect of bilirubin on ATP-ADP dependent systems.

179 **EFFECTS OF VASOACTIVE AGENTS ON INTESTINAL BLOOD FLOW AND MOTILITY IN THE DOG.** *(E.)* Shehadeh, Z. (U. Oklahoma Med. Ctr., Oklahoma City), W. E. Price and E. D. Jacobson. *Amer J Physiol* 216(2):386-392, 1969.

Mesenteric artery blood flow was measured with an electromagnetic flowmeter in 20 anesthetized adult dogs in order to determine the effects of prolonged intraarterial infusion of various doses of vasoactive drugs (histamine, norepinephrine, acetylcholine, angiotensin II, bradykinin, and prostaglandins $E_1$and $F_{2\alpha}$) on mesenteric hemodynamics and intestinal motility. Pressures were measured in the portal circulation, a systemic artery, and in the lumen of the gut. Angiotensin II, norepinephrine, and prostaglandin $F_{2\alpha}$ produced initial constrictor responses, with considerable recovery of blood flow after prolonged perfusion. Prostaglandin E_1, bradykinin, histamine, and acetylcholine induced increases in mesenteric blood flow, the initial responses again being greater than the change after several minutes of perfusion. The effects of these agents on intestinal motility did not correlate with the hemodynamic response. Thus, intestinal motility was increased both by acetylcholine, a vasodilator, and by angiotensin, a vasoconstrictor; motility was diminished both by norepinephrine, a vasoconstrictor, and by prostaglandin E_1, a vasodilator.

180 **DIETARY OBESITY IN RATS: INFLUENCE DIET, WEIGHT, AGE, AND SEX ON BODY COMPOSITION.** *(E.)* Schemmel, R. (Dept. Foods Nutrit., Michigan State U., East Lansing), O. Mickelsen and Z. Tolgay *Amer J Physiol* 216(2):373-379, 1969.

Littermate O-M rats were fed either a grain or a high-fat (60% diet until they reached specific body weights ranging up to 300 g for females and 600 g for males fed the grain diet and 750 g for females and 1050 g for males fed the high-fat diet. Skeletal lengths (nose to anus) of male and female rats fed the grain diet and of males fed the high-fat diet were the sa for comparable body weights. Body mineral (ash) accretion appeared related to the age of the rats, with males having m minerals than females of the same age. Neither diet had any fluence on body protein content through the 100th day of l thereafter, obese rats had 10-20% more body protein than the grain-fed rats. For both dietary groups, body-fat content appeared more closely related to body weight than age. The more rapid the weight gain, the larger the percentage of fat i the newly formed tissue. The increase in body fat was much greater at all ages for the rats fed the high-fat diet. On a pe centage basis, females had slightly more body fat than males

181 **EFFECTS OF ACETYLCHOLINE ON INTESTINAL BLOOD FLOW AND MOTILITY.** *(E.)* Price, W. E. (U. Oklahoma Med. Ctr., Oklahoma City), Z. Shehadeh, G. H. Thompson, L. D. Underwood and E. D. Jacobson. *Amer J Physiol* 216(2):343-347, 1969.

Fifteen anesthetized adult dogs received intraarterial infusion of acetylcholine (14 μg/min for 7 min), during which time mesenteric artery blood flow was measured with an electromagnetic flowmeter and intestinal motility was assessed by means of an intraluminal balloon connected to a pressure

ansducer. Mean superior mesenteric artery blood flow in-
eased from 159 to 178 ml/min during infusion of acetyl-
oline; however, this was due largely to the increased flow
d decreased resistance in the 7 dogs which responded to
etylcholine with a marked increase in bowel motility; there
as no change in superior mesenteric artery blood flow or
sistance in the other 8 dogs. Furthermore, the directional
sociation of motor changes and alterations in blood flow was
t invariable. Although a fall in resistance to blood flow was
nerally associated with increased motility, there was one
ception in each group: one animal in which increased mo-
ity was accompanied by decreased blood flow and one in
ich decreased motility was accompanied by increased blood
w. Unexpectedly, gut wall tone could be increased by in-
ion of saline without increasing the resistance to mesenteric
od flow. The results indicate that acetylcholine produces
solated responses, one in the arteriole and one in the gut
ll.

2 **INTRAHEPATIC DISTRIBUTION OF HEPATIC
ARTERIAL AND PORTAL VENOUS FLOWS
THE DOG.** *(E.)* Cohn, J. N. (VA Hosp., Washington, D. C.)
A. L. Pinkerson. *Amer J Physiol* 216(2):285-289, 1969.

patic blood flow was measured in anesthetized dogs by means
a flowmeter and an indicator-dilution technique. With the
erior vena cava (IVC) occluded below the hepatic veins, flow
ected in the intrathoracic IVC equaled total hepatic blood
v. Isotope-dilution curves were recorded by drawing IVC
od through a well counter during injection of a bolus of
eled albumin or red cells into the hepatic artery (HA) or
tal vein (PV). Hepatic transit of albumin was longer than
of red cells for both injection sites. The ratio between
mean transit times for albumin and red cells averaged 1.42
8 for injections into the PV and 1.34 ± .14 for injections
the HA. Flows calculated from the isotope-dilution curves
ed closely with directly measured flow in some studies but
estimated actual flow in others. However, there was no
ematic difference between values obtained following injec-
s into the PV or HA. These data suggest that the HA per-
s sinusoids to an extent similar to the PV and that intra-
atic mixing of HA and PV blood usually occurs.

**STUDIES ON THE ROLE OF THE INTESTINAL
MICROFLORA IN THE METABOLISM OF
MARIN IN RATS.** *(E.)* Scheline, R. R. (Dept. Pharmacol.,
orway). *Acta Pharmacol (Kobenhavn)* 26(4):325-331, 1968.

n coumarin (100 mg/kg) was administered p.o. or i.p. to
albino rats, thin layer chromatography of the urine re-
d significant amounts of melilotic acid (5-10% of the amount
hydroxyphenylacetic acid) and traces of o-coumaric acid.
robic incubation of coumarin with rat cecal or rabbit fecal
cts also produced melilotic acid, optimum yields being ob-
d at a pH of 6.4-6.6. Since no o-coumaric acid was pro-
d *in vitro*, the conversion of coumarin to melilotic acid is
ed to involve reduction to dihydrocoumarin and subsequent
ission. Yields of the urinary metabolite were reduced 50-
when coumarin was injected compared to when it was ad-
tered orally, or when antibiotics were administered. Ob-
d differences in metabolic rates probably indicate varying
floral capabilities, although only partial inhibition by
iotics and the variation in metabolic products suggest that
ssue may be an additional site of coumarin metabolism.

184 **EVALUATION OF THE EFFECTS OF EGG YOLK LIPIDS UPON PLASMA LIPIDS IN HUMAN SUBJECTS.** *(E.)* Splitter, S. D. (Highland Gen. Hosp., Oakland, Calif.), G. D. Michaels, G. Schlierf, P. D. S. Wood and L. W. Kinsell. *Metabolism* 17(12):1129-1139, 1968.

The effect of large amounts of egg yolk and different egg-yolk fractions on the levels of plasma cholesterol and other lipids was studied in 13 normal and abnormal subjects, including 6 patients maintained under quantitatively controlled conditions on the metabolic ward and 7 ambulatory, healthy, volunteer adults ranging in age from 25-58 yr. In the ambulatory patients, cooked egg yolk was consumed in amounts equivalent to 50-60 g of yolk/day. Yolk lipid represented more than 95% of the dietary fat and the diet was consumed for at least 2 weeks. In the metabolic ward studies, the egg yolk or yolk lipid fractions were emulsified and consumed as a formula ingested at 2-hourly intervals from 9 a.m. to 7 p.m. The plasma lipids of the ambulatory patients were determined 3 times weekly during the study. In none of these 7 subjects was any marked elevation of plasma cholesterol observed during the ingestion of egg yolk as compared to the previous values on an average diet; with one possible exception, there were also no differences in plasma cholesterol levels during ingestion of commercial egg yolks or egg yolks from hens fed on safflower-oil diet. Significant increases in plasma cholesterol levels during feeding of egg yolk were observed in 2 of the 6 patients. For example, in a 61-yr-old Filipino male with generalized arteriosclerosis, plasma cholesterol levels increased above 350 mg/100 ml with whole egg yolk and approached 250 mg/100 ml when simulated yolk triglyceride was given. No increase in plasma cholesterol was observed when crystalline cholesterol was dissolved in the simulated triglyceride mixture. Findings in 3 other patients from the metabolic ward are presented in detail.

185 **BINDING OF TRYPSIN AND CHYMOTRYPSIN BY HUMAN INTESTINAL MUCOSA.** *(E.)* Goldberg, D. M. (Royal Hosp., Sheffield, England), R. Campbell and A. D. Roy. *Biochim Biophys Acta* 167(3):613-615, 1968.

Human ileostomy material and normal human small intestinal mucosa were utilized in a study of the binding of trypsin and chymotrypsin. The adsorption of trypsin and chymotrypsin by suspensions of intact intestinal epithelial cells was found to be pH dependent with a maximum at pH 5.0. The capacity of human ileal contents to adsorb trypsin and chymotrypsin was largely due to the content of exfoliated epithelial cells, and a higher percentage of chymotrypsin was usually associated with insoluble material. The binding did not seem to involve covalent or disulfide bonds, and no evidence was obtained for the particpiation of protein, nucleic acid or polysaccharide. Binding of both enzymes to intestinal debris manifested the same chemical properties as binding to human intestinal epithelial cells.

186 **PROCEEDINGS OF THE 1967 DEUEL CONFERENCE ON THE FATE OF DIETARY LIPIDS, FEBRUARY 15-18, 1967. CARMEL, CALIFORNIA.** *(E.)* [Cowgill G. (Pasadena California) and L. W. Kinsell (eds.)] Washington, D. C., U.S. Government Printing Office, 1968, 238 pp. U.S. Public Health Service Publication No. 1742.

187 **COMPARATIVE BIOCHEMICAL STUDIES ON THE GLUTAMATE-OXALOACETATE TRANSAMINASE ISOZYMES.** *(Jap.)* Yana, K. (Nippon Med. Sch., Japan). *Nippon Ika Daig Z* 35(3):210-220, 1968.

188 **INACTIVATION OF ENZYMES BY ASPIRIN AND SALICYLATE.** *(E.)* Grisolia, S. (U. Kansas Med. Ctr., Kansas City), I. Santos and J. Mendelson. *Nature* 219(5160):1252, 1968.

189 **FLUCTUATIONS IN SERUM CHOLESTEROL LEVELS IN THE MONKEY.** *(E.)* Alexander, G. J. (New York State Psych. Inst., New York City) and L. M. Kopeloff. *Amer J Med Sci* 257(1):24-31, 1969.

190 **RATE STUDIES ON THE BINDING OF BILIRUBIN BY ION-EXCHANGE RESINS.** *(E.)* Sawchuk, R. J. (U. Toronto, Ontario, Canada) and J. G. Nairn. *J Pharm Sci* 57(11):1896-1899, 1968.

191 **THE USE OF COMPUTERS TO STUDY RATES OF LIPID METABOLISM.** *(E.)* Baker, N. (UCLA Sch. Med., Los Angeles, Calif.). *J Lipid Res* 10(1):1-24, 1969.

192 **HYPOTHESES ON PHYSIOLOGICAL ROLES OF PROSTAGLANDINS.** *(E.)* Horton, E. W. (Sch. Pharmacy, U. London, England). *Physiol Rev* 49(1):122-161, 1969.

193 **MEASUREMENTS OF CHOLESTEROL TURNOVER, SYNTHESIS, AND ABSORPTION IN MAN, CARRIED OUT BY ISOTOPE KINETIC AND STEROL BALANCE METHODS.** *(E.)* Grundy, S. M. (Rockefeller U., New York City) and E. H. Ahrens Jr. *J Lipid Res* 10(1):91-107, 1969.

194 **CORRELATION BETWEEN INTESTINAL STRUCTURE AND FUNCTION.** *(Fr.)* Booth, C. C. (Postgrad. Med. Sch., London, England). *Rev Medicochir Mal Foie* 43(5):181-188, 1968.

195 **NUTRITIONAL REQUIREMENTS FOR VITAMI B AND FOLIC ACID.** *(E.)* Herbert, V. (Mt. Sinai Hosp., New York, N. Y.). *Amer J Clin Nutr* 21(7):743-752, 196

DIAGNOSTIC PROCEDURES

96

**CORRELATION BETWEEN GASTRIC ACID SECRETION AND HISTOLOGY IN INDIAN
UBJECTS.** *(E.)* Desai, H. G. (Tata Mem. Hosp., Bombay,
ndia), A. V. Borkar and K. N. Jeejeebhoy. *Scand J Gastroent*
(5):509-512, 1968.

astric acid output in the augmented histamine test (AHT)
nd histamine infusion test (HIT) was correlated with the
istology of the gastric mucosa (single biopsy) in 102 Indian
ıbjects (81 males and 21 females, 18-70 yr old), including
5 controls, 42 patients suffering from vague gastrointestinal
ymptoms, 24 with tropical sprue, and 11 with iron-deficiency
nemia. Histologically, 48 of these had a normal gastric mu-
osa, 15 had superficial gastritis, 16 had moderate atrophic
astritis, and 23 had severe atrophic gastritis. A good correla-
on was observed between the histology of the gastric mucosa
d acid output in both the AHT (51 subjects) and HIT (69
bjects). All subjects with a normal mucosa had an acid out-
ıt of greater than 8 mEq/hr in the AHT and 14 mEq/hr in
e HIT. The acid output was significantly lower in subjects
th different grades of chronic gastritis and showed a good
rrelation with the histological severity of the gastritis. None
the patients with a normal mucosa or with superficial or
oderate atrophic gastritis had achlorhydria. Among patients
th severe atrophic gastritis, achlorhydria was present in all 8
bjects given the AHT and in 15 out of 18 subjects given the
T. One patient showed achlorhydria in the AHT but not in
e HIT. In subjects with a normal gastric mucosa, the acid
tput in the HIT was found to be comparable to that reported
patients from Britain, but comparatively lower values were
served in the AHT. It is concluded that subjects showing an
d output of less than 8 mEq/hr in the AHT and less than
mEq/hr on the HIT are probably suffering from chronic
tritis, but that the diagnosis should be confirmed by biopsy.

7

^{95}Nb-LABELLED ALBUMIN FOR THE STUDY OF GASTROINTESTINAL ALBUMIN LOSS.
) Jeejeebhoy, K. N. (Tata Mem. Hosp., Bombay, India),
Jarnum, B. Singh, G. D. Nadkarni and H. Westergaard.
nd J Gastroent 3(5):449-457, 1968.

^{95}Nb-albumin which contains little, if any, denatured protein
prepared and studied to test its suitability for the detection
gastrointestinal protein loss. A total of 23 subjects (18 con-
ls and 5 patients with protein-losing enteropathy of varying
logy) received simultaneous i.v. injections of ^{95}Nb-albumin
^{131}I- or ^{125}I-albumin. All 5 patients had an elevated
ıbolic rate of ^{131}I- or ^{125}I-albumin, and in 4 cases gastro-
stinal protein loss was demonstrated by means of ^{51}Cr-
ımin or ^{59}Fe-labeled iron dextran. ^{95}Nb-albumin which was
ified by only a single chromatographic passage disappeared
n the plasma at a much higher rate than ^{131}I-albumin; how-
, in 5 control subjects given a preparation purified twice on
EAE column, the plasma disappearance curves for ^{95}Nb-
min and ^{131}I-albumin were practically identical. Five
ents studied with fairly satisfactory ^{95}Nb-albumin prepara-
s excreted 7-31% of the injected ^{95}Nb in the stools in 6
. Their gastrointestinal ^{95}Nb clearance was 3-33% of the
vascular pool per day. Of the 4 patients studied with both
b-albumin and ^{51}Cr-albumin or ^{59}Fe-labeled iron dextran, one was within the normal range with regard to fecal ^{95}Nb excretion, but the gastrointestinal clearance of all 3 test substances was elevated in all. The urinary excretion of ^{95}Nb was low in all patients compared to that of ^{131}I- or ^{125}I in studies with radioiodine-labeled albumin. These results confirm those of preliminary studies in which it was shown that ^{95}Nb-albumin is a suitable test substance for detection of abnormal gastrointestinal protein loss.

198

THE VALUE OF THE LATERAL STOOPING POSITION IN THE DEMONSTRATION OF THE CARDIA AND FUNDUS OF THE STOMACH. *(E.)* Ryan, M. J. (St. Laurence's Hosp., Dublin, Ireland). *Brit J Radiol* 41(492):905-908, 1968.

Five illustrative examples (2 carcinomas, 1 malignant ulcer, 1 leiomyoma, and 1 pseudo-filling-defect) are presented in which a technique utilizing the lateral stooping position was used to provide better visualization of the stomach cardia and fundus, thereby revealing previously unnoticed or misdiagnosed lesions. The technique, which utilizes the conventional barium meal and swallowed air, may be combined with gastric air insufflation (an effervescent drink or aerosol barium) if necessary, and can be employed in most patients except those who are unable to flex the spine.

199

SUPERSELECTIVE PANCREATIC ANGIOGRAPHY. *(E.)* Reuter, S. R. (Dept. Radiol., U. Michigan, Ann Arbor). *Radiology* 92(1):74-85, 1969.

In 76 of 99 patients with suspected pancreatic disease examined by combined celiac-superior mesenteric angiography, superselective catheterization of the hepatic, splenic, gastroduodenal, dorasal pancreatic, or inferior pancreaticoduodenal arteries was attempted following the combined study. Two or more superselective studies were attempted in 35 of the 76 cases. The combined celiac-superior mesenteric study was performed in the standard manner with 2 thin-walled Kifa red catheters (1 into the superior mesenteric artery via one femoral artery, and 1 into the celiac axis via the other femoral artery). Fifty-four of 61 attempts at hepatic artery catheterization were successful; in 40 of these 54 cases, gastroduodenal artery catheterization was successful. Twelve of 18 attempts to catheterize the inferior pancreaticoduodenal artery, 15 of 20 attempts to enter the dorsal pancreatic artery, and 24 of 25 attempts to enter the splenic artery were successful. The superselective studies added only minimally to the time required for conventional pancreatic angiography, and the resulting demonstration of arteries in and around the pancreas was better than that obtained by combined celiac-superior mesenteric angiography. The vessels filled better than with the conventional method, and were visualized free of overlying gastric and superior mesenteric artery branches. The results of this study indicate that adequate super-selective pancreatic angiography requires injection of both the gastroduodenal and splenic arteries.

200

STUDIES IN KERNICTERUS. II. THE DETERMINATION OF THE SATURATION OF SERUM ALBUMIN WITH BILIRUBIN. *(E.)* Odell, G. B. (Johns Hopkins U. Sch. Med., Baltimore, Md.), S. N. Cohen and P. C. Kelly. *J Pediat* 74(2):214-230, 1969.

A method is described for estimating the relative concentration of free bilirubin in serum by measuring the saturation of the carrier, albumin, for bilirubin. The technique is based on the change in optical density at 460 mμ of the diluted serum after addition of a standardized amount of salicylate, which displaces bilirubin from albumin. The change in optical density at 460 mμ was calibrated to the % decrease in protein-bound bilirubin by separating and chemically determining the free and residual protein-bound bilirubin in model sera. When the technique was applied to hyperbilirubinemic sera from 124 neonatal infants, the 65 without hemolytic disease showed a direct correlation between the saturation of their albumin with bilirubin and the bilirubin-protein concentration ratio of the serum. Infants with hemolytic disease did not show such a correlation until after they had had an exchange transfusion. The determination of the free bilirubin offers a more precise means of selecting infants at risk to bilirubin encephalopathy.

201 SERUM γ-GLUTAMYL TRANSPEPTIDASE ACTIVITY IN INFECTIOUS HEPATITIS. *(Cz.)* Skálová, E. (Med. Fac., J. E. Purkinje U., Brno, Czechoslovakia) and D. Dimov. *Cesk Gastroent Vyz* 22(6):411-416, 1968.

The activities of serum γ-glutamyl transpeptidase, SGOT, SGPT, leucine aminopeptidase, and alkaline phosphatase were determined in 49 patients with infectious hepatitis. The increase in γ-glutamyl transpeptidase activity was comparable to that of leucine aminopeptidase or alkaline phosphatase, but was much less than that of SGPT or SGOT. Jaundiced patients had SGOT and SGPT activities which were significantly higher than those of anicteric patients. In contrast to SGOT and SGPT activities, γ-glutamyl transpeptidase, leucine aminopeptidase, and alkaline phosphatase activities tended to be highest in patients with mild hepatitis and lowest in those with severe forms. γ-Glutamyl transpeptidase activities were significantly higher than normal in patients with mild, moderately severe, and severe hepatitis but there was no significant differences between these 3 groups. During infectious hepatitis, γ-glutamyl transpeptidase activities closely paralleled those of leucine aminopeptidase, but in 56% of the cases it differed from the courses of SGOT and SGPT and that of the bilirubin levels. Corticosteroids, given to 8 patients, immediately produced further increases in γ-glutamyl transpeptidase activity in all 5 cases in which they were studied. These findings suggest that, during hepatitis, the rate of the reaction in which γ-glutamyl transpeptidase takes part is speeded up, liver cells respond by synthesizing more enzyme, and excess enzyme spills over into the blood. Thus the increase in γ-glutamyl transpeptidase activity is related to regeneration in the liver parenchyma.

202 THE DIAGNOSIS OF ACUTE AND ANICTERIC FORMS OF INFECTIOUS HEPATITIS WITH A MICROMETHOD FOR DETERMINING SERUM AMINOTRANSFERASE ACTIVITIES. *(Rus.)* Osherovich, A. M. (Munic. Sanit. Epidemiol. Sta., Moscow, USSR) and B. I. Mil'ner. *Zh Mikrobiol* 45(10):127-131, 1968.

From 1963 to 1965, a modification of the method of Wrightman and Fraenkel was used to determine alanine-ketoacid aminotransferase activities in the sera from 38,000 children suspected of having infectious hepatitis and their contacts; 160 children (4.2%) had activities higher than 15 units. A diagnosis of infectious hepatitis was confirmed in 72.5% of the 936 hospitalized children, but in only 14 (4%) of the 375 children who were allowed to remain at home. This is attributed to poorer follow-up, making it more difficult to diagnose cases which rapidly became asymptomatic and anicteric. A diagnosis of infectious hepatitis was established in 401 of the 545 children hospitalized only on the basis of this test. Of these, 14.2% had jaundice, 34.4% had subsiding hepatitis, 47.2% had anicteric forms, 2.2% had subclinical forms, and 2% were convalescing. Elevations in alanine-ketoacid aminotransferase activity were not specific for infectious hepatitis. False-positive results were obtained on 80 healthy children; 34 with upper respiratory infections, chronic tonsillitis, or sore throat; 17 with parasitic infestations; and 13 with other diseases.

203 THE IMPORTANCE OF ANGIOGRAPHY IN ULCERATIVE HEMORRHAGIC RECTOCOLITIS. *(Fr.)* Hernandez, C. (Bichat Hosp., Paris, France), J. Boisson and M. Parturier-Albot. *Actualites Hepatogastroent Hotel Dieu* 4(4):A233-A248, 1968.

On the basis of 90 angiograms, it was confirmed that the characteristic signs of ulcerative colitis consistently include thickening of the walls of the colon, particularly at the left angle, and the early appearance of venous return; in addition, there is sometimes a reduction in the number, or a complete absence, of arterioles which originate from the mesenteric artery in affected areas of the colon. In 5 cases lesions were found endoscopically and histologically but not radiologically. In 3 cases radiological signs of ulcerative colitis were found, but the rectum remained intact and endoscopic examination was negative. In 2 cases endoscopic and radiological findings were suggestive, but angiography had to be used to confirm the diagnosis. One patient had a rare combination of ulcerative hemorrhagic rectocolitis and a small rectal cancer which appeared to have preceded it.

204 TRANSUMBILICAL PORTAL CATHETERIZATION. *(Fr.)* Hefti, M. L. (Med. Clin., U. Zurich, Switzerland) and W. Wirth. *Actualites Hepatogastroent Hotel Dieu* 4(4):B127-B137, 1968.

During 1966-67, transumbilical portal catheterization was performed successfully on 10 of 24 patients (8 with cirrhosis, 8 with hepatic metastases, and 8 with hepatomegaly and suspicion of metastases). Failures were due to inability to locate the round ligament of the liver (4 cases), perforation of the round ligament (3 cases), complete puncture of the left branch of the portal vein (1 case), small diameter or tapering of the round ligament (6 cases), and metastasis or regenerative nodule in the round ligament (2 cases). Complications included 2 episodes of mild bleeding, 2 mild venous hemorrhages in the falciform ligament of the liver, and 7 accidental perforations of the peritoneal cavity. The technique and some of its uses are described in detail.

205 CURRENT STATUS OF DUAL-CHANNEL PANCREAS SCANNING. *(E.)* Fink, S. (VA Hosp., Hines, Ill.), M. Ben-Porath, B. Jacobson, G. D. Clayton and E. Kaplan. *J Nucl Med* 10(2):78-82, 1969.

The dual-channel scanning technique was applied to the diagnosis of pancreatic disease in 109 adult male patients, 35-76 yr old, including 36 normal controls, 10 with pancreatic carcinom 19 with chronic pancreatitis, 17 with Laennec's cirrhosis, 8 with acute recurrent pancreatitis, one with a massive intraperitoneal hematoma, and 18 with unconfirmed diagnoses. One hr after breakfast each patient received 100 μC of ^{198}Au-colloid and 250 μC of ^{75}Se-selenomethionine i.v. Subtraction of the Au counts when the two counts were made equal over the liver eliminated the readings from this organ. The normal and pathological scans were distinguished on the basis of the anatomical onfigurations of the liver, pancreas and spleen (when present), he presence of absence of diffuse or focal defects in the liver nd pancreas, and the relative level of ^{75}Se visualized outside hese organs. The pancreas and liver were consistently visual- zed ("normal" scan) in 31 of 36 controls (4 showed a "pan- reatitic" scan) and 16 of the 73 others (including 4 of 8 with cute pancreatitis). Scans of 8 of 10 patients with carcinoma howed "cold" areas in the gland, as did 3 of 17 cases of cir- hosis. In 12 of 19 patients with chronic and 4 of 8 with acute ancreatitis, scans differed greatly from those of normal subjects. ypical "cirrhotic" scans were obtained in 10 of 17 patients ith cirrhosis, 1 case of chronic pancreatitis and 1 control. ith the exception of visualization of the spleen, scans similar o those in carcinoma of the pancreas were obtained in patients ith cirrhosis. The need for caution in interpreting pancreatic ans is stressed.

06 SERUM AMYLASES, ISOENZYMES, AND PANCREATITIS. I. EFFECT OF SUBSTRATE ARIATION. *(E.)* Meites, S. (Dept. Pediat., Ohio State U. ll. Med., Columbus) and S. Rogols. *Clin Chem* 14(12):1176-84, 1968.

hen 4 different plant starches were used in Searcy's sac- arogenic ultramicromethod to study human amylase activity normal serum and urine, "pancreatitis" serum, secretin- mulated duodenal fluid, saliva and pancreatic extract, the e of digestion was found to be dependent on the starch ected as the substrate. Suspensions (1 g/100 ml phosphate- ine buffer) of waxy maize, high-amylase corn, potato and n starches were prepared after lintnerization. Digestion of xy maize starch was generally most rapid. Normal serum, ne and saliva digested potato starch more rapidly than corn ch, while pancreatitis serum, duodenal fluid, and pancreatic ract digested corn starch more rapidly than potato starch. results suggest that the amylases studied are organ-specific that plant starches might be used to distinguish between m for diagnostic purposes.

USE OF VITAL DYES IN THE EVALUATION OF THE BLOOD SUPPLY OF THE COLON. Myers, M. B. (Louisiana State U. Sch. Med., New Orleans) G. Cherry. *Surg Gynec Obstet* 128(1):97-102, 1969.

reliability of patent blue V or fluorescein in determining viability of devascularized segments of the colon was in- igated in 23 dogs simulating 3 different clinical situations in 10 human patients undergoing colonic operations. The nal experiments clearly showed that all fully-stained intes- segments survived; however, in some cases, unstained or ially-stained colon also survived. When the intestine was scularized by dividing the central vessels, the mesenteric ular arcade being left intact (simulating aortic resection ligation of the inferior mesenteric artery at its origin), potential for revascularization was great and the dye test not reliable. When the mesenteric vessels were completely severed to simulate some forms of mesenteric trauma, the method was more accurate but in most cases, 2.5 cm more intestine survived than the test predicted. In 6 dogs with a 5-cm segment of devascularized colon plus an anastomosis, the demand for blood was greater and only intestine which showed full staining survived. Microscopic sections confirmed the gross observations. Postmortem angiograms revealed vessels extending far into the devascularized intestine, indicating that, although nonfunctional during life, excellent potential collateral circulation existed. In the clinical cases, fluorescein was used and the results were accurate in all 10 patients; only intestine showing good fluorescence survived. The distribution of fluorescein in the human colon and ileum (average of 1.5 cm beyond the divided mesentery) indicates that the functional intramural blood supply in man is less than in the dog.

208 ARTERIAL PATTERNS OF PANCREATIC LESIONS. *(E.)* Bierman, H. R. (Cedars-Sinai Med. Ctr., Los Angeles, Calif.), D. E. Zion, H. J. Stulberg and E. L. Silberman. *Angiology* 20(1):13-21, 1969.

Four conventional approaches to pancreatic angiography (aortography, selective superior mesenteric and celiac arteriography, selective gastroduodenal arteriography, and pharmacoangiography of the celiac artery and its branches) are briefly reviewed and the authors' experience with pharmacoangiography using sodium nitroprusside is presented. Administration of 10-40 mg of sodium nitroprusside i.a. within 30-60 sec produces selective venous stasis in the area of immediate infusion, with a transient hypotensive effect. Increased opacification and even filling of the smaller arteries is apparent during the arterial phase. The arcades to the gastrointestinal viscera are markedly increased in fine detail. As expected, there is increased arterial vascularization of neoplastic lesions within the liver, pancreas and contiguous areas, although capillary filling cannot be observed in fine detail. The extraordinary visualization of vessels in the gastroduodenal mucosa and increasingly opacified areas within the pancreatic parenchyma suggest that very small lesions and distortions of the normal pattern should be discernible by this technique. Venous opacification is markedly delayed 5-10 sec after administration of nitroprusside. Additional refinements, such as a pressure-sensing device at the catheter tip to monitor peripheral hypotension, and visual recording to help select the pressure nadir more precisely, would increase the usefulness of pharmacoangiography as a diagnostic tool.

209 RENAL EXCRETION OF AMYLASE AND LIPASE BY DOGS. *(E.)* Eto, K. (Hahnemann Med. Coll., Philadelphia, Pa.), F. W. Pairent, H. E. Appert and J. M. Howard. *Arch Surg* 98(2):241-244, 1969.

The relation between serum concentration and urinary output of amylase and lipase was investigated in 12 dogs by determining the renal clearance of these enzymes in the normal animal and again after pancreatic duct ligation, i.v. infusion of pancreatic juice or pancreatectomy. The mean amylase clearance for normal dogs (0.50 ml/min) was very similar to that observed in humans. Lipase cleared at higher rates (9.2 ml/min), suggesting a considerably lower molecular weight. Following ligation of the pancreatic duct, serum amylase and lipase levels rose 1-4 weeks postoperatively and then fell, while urinary enzyme output remained relatively unchanged. Thus, the apparent clearance rates of both enzymes were lower than normal. After i.v. infusion of a 1:1 mixture of pancreatic juice and creatinine-p-aminohippurate, serum amylase increased 4-fold and serum lipase increased 6-fold, but the urinary clearance rates for both enzymes decreased since total urinary enzyme output remained constant or increased only moderately. Pancreatectomy resulted in decreased serum concentrations of both enzymes and decreased urinary enzyme output. The extreme variability of the renal clearance values indicates that these enzymes are not actually filtered by the kidney in proportion to the serum concentrations. Measuring renal clearance rates of amylase and lipase therefore would not contribute significantly to the diagnosis of human pancreatic disease. The enzyme activity present in the serum after pancreatic atrophy or pancreatectomy suggests an extrapancreatic source of amylase and lipase.

210 OPERATIVE CHOLECYSTOCHOLANGIOGRAPHY

(E.) Goldman, L. I. (Temple U. Hlth. Sci. Ctr., Philadelphia, Pa.), M. Weinberger, D. A. DeLaurentis and W. E. Burnett. *Surg Gynec Obstet* 128(2):279-282, 1969.

Primary operative cholecystocholangiography was evaluated in 96 patients (24 males and 72 females; average age 50 yr) who underwent elective cholecystectomy for cholelithiasis. Patients with acute cholecystitis, active jaundice or acute pancreatitis were excluded. Satisfactory opacification was achieved in 87% of the patients, and no morbidity or mortality was attributable to the procedure. Radiographic indications for common duct exploration correlated well with actual stone retrieval, and filling defects were the only indication for duct exploration in 2 patients in whom stones were retrieved. There was one false-negative, possibly due to the minute size of the calculi. In no case were stones expelled into the bile duct through manipulation of the gallbladder during expression of the contrast medium. Follow-up examination (3 months-7 yr) has shown no known instances of retained or recurrent common duct stones.

211 THE IMPORTANCE OF DETERMINING CIRCULATING ANTILIVER ANTIBODIES IN THE CHARACTERIZATION OF THE ACTIVITY OF CHRONIC HEPATITIS AND HEPATIC CIRRHOSIS.

(Rus.) Nogaller, A. M. (Astrakhan Med. Inst., USSR) and G. M. Smoliakova. *Ter Arkh* 40(10):62-66, 1968.

The results of tests for serum alanine and asparagine transaminases, C-reactive protein, sialic acid, and serum protein fractions and the thymol, calomel, and cadmium tests were compared with the clinical signs and results of Steffen's reaction for serum antiliver antibodies in 79 patients with chronic hepatitis and 101 with cirrhosis (111 men, 69 women). Positive Steffen's reactions were seen in 29% of the patients with chronic hepatitis and 65% of those with cirrhosis. Positive tests occurred most frequently in patients with postnecrotic cirrhosis. Steffen's reaction was positive in 87% of the patients with clinical, biochemical, and histological signs of active liver disease. Antiliver antibody titers decreased in only 7 patients during treatment with glucocorticoids and anabolic hormones, vitamins, antibiotics, diuretics, and other agents. In most cases the antibody titer remained the same after treatment, indicating that the disease was progressive in nature. Steffen's test is not strictly specific: antiliver antibodies were also found in a very small percentage of patients with rheumatic heart disease and myocardial infarction.

212 MUST POSTOPERATIVE VISUALIZATION OF THE BILIARY TRACT WITH CONTRAST MEDIUM BE DONE BY RADIOMANOMETRY?

(Ger.) Mattig, H. (St. Georg Distr. Hosp., Leipzig, Germany). *Zbl Chir* 93(32):1107-1120, 1968.

Results obtained by postoperative radiomanometry, mostly with image intensification on a TV circuit with or without flow measurements, on 150 patients who had undergone choledochotomy and in whom T-drains had been inserted are compared with those in 220 patients examined by T-tube cholangiography. Subjective symptoms and fever occurred more frequently with T-tube cholangiography. The pancreatic duct was completely or partially visualized in 45 (30%) of the 150 patients examined by radiomanometry, particularly at higher pressures (30-40 cm contrast medium), but in only 31 (14%) of the 220 examined by T-tube cholangiography. Radiomanometry is preferred to T-tube cholangiography, not only because it is better tolerated and reduces the risk of damage to the biliary tract, liver, and pancreas, but because it ensures better visualization of the major duodenal papilla. The technique and prerequisites for this procedure are described in detail.

213 THE SEDIMENTATION OF PERCHLORATE-SOLUBLE MUCOPROTEINS FROM PATIENTS WITH OBSTRUCTIVE JAUNDICE.

(It.) Monosi, V. (San Giuseppe da Copertino Munic. Hosp., Copertino, Italy). *Osped Ital Chir* 19(2):127-133, 1968.

The method of Malfatti *et al.* was used to determine the serum mucoproteins in 26 patients, aged 25-84 yr, with different forms of obstructive jaundice. These included 5 with acute icteric hepatitis, 12 with cholelithiasis and choledocholithiasis, and 9 with malignant neoplasms of the liver or biliary tract. The largest amounts of precipitate were obtained in sera from patients with malignant neoplasms complicated by obstructive jaundice. Somewhat smaller amounts were obtained from patients with biliary tract disease complicated by cholangitis. Normal, or smaller than normal, amounts were found in sera from patients with gallstones and acute icteric hepatitis.

214 IMPROVED PORTOGRAPHY BY DELAYED POSTEPINEPHRINE CELIAC AND MESENTERI ARTERIOGRAPHY.

(E.) Kahn, P. C. (New England Med. Ctr Hosp., Boston, Mass.), J. F. O'Halloran and R. E. Paul Jr. *Radiology* 92(1):86-89, 1969.

A technique for improved visualization of the portal circulation as well as of the liver and spleen parenchyma, is described in which arteriography is performed 7-10 min after infusion of epinephrine (16-24 ml of solution containing 1 μg epinephrine/ saline) into the celiac axis or superior mesenteric artery. Clinical application in over 90 cases has indicated that this technique is reliable and simpler than others which have been proposed. Displacement, invasion and occlusion due to tumors could be demonstrated. In nearly every case of marked portal hypertension, adequate visualization of the portal circulation w achieved, and the density of the portal venous system often almost equalled that of a direct splenoportogram. Portal flow was accelerated, no consistent changes in the size of arteries or veins were observed, and increased opacification of the cystic arteries and gallbladder wall frequently occurred.

The spleen was reduced in length by an average of 1 cm. The echnique can be combined with other procedures such as se- ective splenic artery injection, dual catheters, or large-volume uperior mesenteric arteriography.

15 **SERUM ALPHA-FETO-PROTEIN. I. IMMUNODIFFUSION AND IMMUNO-ASSAY RESULTS N CASES OF PRIMARY CANCER OF THE LIVER.** *(E.)* urves, L. R. (South African Inst. Med. Res., Johannesburg), I. Macnab and I. Bersohn. *S Afr Med J* 42(42):1138-1141, 968.

n a series of 130 male Africans with autopsy- or biopsy-con- rmed liver cancer, Ouchterlony immunodiffusion and quanti- itive immunoassay techniques revealed α-feto-protein in the ra of 96 and 102 patients, resp.; sera were analyzed on ad- ission and at regular intervals thereafter until discharge or eath. Values ranged from 0.1 to 710 mg/100 ml, with a mean lue of 39.2 mg/100 ml for the first analysis. There was a nstant increase of about 65% from the first analysis to the st (mean interval 2.4 months) irrespective of the initial value. ese results suggest either a feedback control mechanism, the tting of which is unique for every patient, or a state of equi- rium, with tumor necrosis and fibrosis balancing new tumor owth so that serum α-feto-protein levels remain fairly con- nt despite tumor size. By concentrating the sera of some tients, diluting the antiserum, and prolonging the diffusion ne, it was possible to detect values between 0.1 and 1.0 /100 ml and thus increase the proportion of positive results. false positives were observed among 86 controls with tuber- osis, schistosomiasis or cirrhosis. The development of a more sitive assay would decrease the number of negative results t might also create difficulties with immunological cross-re- ions.

6 **EXPERIENCE WITH AND TECHNIQUE FOR PUNCH BIOPSY OF THE LIVER IN A NEURO- GICAL HOSPITAL.** *(Rus.)* Ivanova-Smolenskaia, I. A. (Inst. urol., Acad. Med. Sci. USSR, Moscow), N. I. Levchenko and V. Chernigovskaia. *Zh Nevropat Psikhiat Korsakov* 68(12): 6-1809, 1968.

e Menghini needle was used to perform 44 liver biopsies on patients with multiple sclerosis and 24 with “hepatocerebral trophy”. Preparations for biopsy included: 1) sedation; 2) ninistration of menadione sodium bisulfite i.m. and calcium conate, ascorbic acid, and rutin orally for several days before; cleansing of the intestines; and 4) X-ray survey of the ab- nen with the patient on his back and left side. Biopsies were made if the patient had 1) diffuse hyperkinesia, 2) a psy- sis, 3) clinical symptoms of a hemorrhagic syndrome, platelet nts less than 25% of normal, or prothrombin lower than 70%, ronounced meteorism, or 5) fever. None of these patients eloped any complications.

THE VALUE OF AND INDICATIONS FOR FIBROGASTROSCOPY: STUDY OF A FIRST IES OF 200 EXAMINATIONS. *(Fr.)* Chappellart, P. ussais Hosp., Paris, France). *Sem Hop Paris* 44(74):3383- 6, 1968.

00 gastroscopic examinations, 60 were performed sys- atically, 45 to elucidate a doubtful radiological image, 32 onfirm the nature of an established lesion, and 45 to study abnormalities found in the antrum. When used systematically, results were positive in 20 cases (30%), negative in 30 (50%), and doubtful in 10 (15%). Positive results include 7 cases in which lesions were not detected radiologically and 13 cases of gastritis. When used to elucidate a doubtful radiological diagnosis, results were negative in 18 cases, positive in 9, and doubtful in 7. A functional anomaly of the antrum or gastritis was found in the remaining 11 cases. When used to confirm the nature of a lesion detected radiologically, agreement was obtained in 26 cases, the diagnosis was changed in 1 case, and doubtful results were obtained in 5. When used to elucidate abnormalities in the antrum, fibrogastroscopy gave negative results in 12 cases, confirmed the presence of an organic lesion in 10, and gave no clear-cut results in 2. Functional anomalies of the antrum were found in 21 of these cases. Antral anomalies were found in 30 (15%) of the total number of patients.

218 **INFUSION CHOLANGIOGRAPHY.** *(Cz.)* Horak, J. (Cent. Milit. Hosp., Prague-Střešovice, Czechoslovakia). *Cesk Radiol* 21(6):361-365, 1968.

A modified technique for infusion cholangiography is described which involves infusion of 250 ml of a 5% glucose solution, 60 ml Biligrafin forte (iodipamide sodium) and 10 ml Celaskon over a period of 1 hr and i.m. injection of 1 ml pethidine. Exposures are taken at 15-min intervals for 60 or 90 min. Results of infusion cholangiography on 50 patients were compared with those obtained by routine i.v. cholangiography on 50 other patients. With i.v. cholangiography the gallbladder filled in 28% of the cases and the biliary tract in 64%, while with infusion cholangiography these figures were 55% and 82%, resp. The contrast medium was better tolerated in infusion cholangiography, but 2 patients did develop complications. About 15 min from the time infusion was begun, a 56-yr-old man developed epigastric pain, nausea, moderate cyanosis and tachycardia. He responded rapidly to treatment with 10 ml thenalidine, 2 doses of 100 mg hydrocortisone 15 min apart, 0.5 mg atropine, and inhalation of O_2. After infusion of about 20 ml of contrast medium, a 51-yr-old woman became very flushed in the face and developed moderate edema of the eyelids and ears, a few pimples on the back, and a headache. She responded quickly to 100 mg cortisone and 10 ml thenalidine. The patient later told of a similar experience with i.v. cholangiography. Another 3 patients developed urticaria, but they responded to administration of thenalidine and it was not necessary to discontinue the infusion.

219 **EXPERIMENTAL AND CLINICAL STUDIES OF PERCUTANEOUS SPLENOPORTOGRAPHY (ON THE INDICATIONS FOR OPERATIVE INTERVENTION FOR MALIGNANT TUMORS IN THE UPPER ABDOMEN).** *(Jap.)* Nakai, W. (Sch. Med., U. Hirosaki, Japan). *Hirosaki Med J* 20(1):89-116, 1968.

Percutaneous splenoportography was performed prior to surgery in 108 patients with malignant tumors of the upper abdomen in order to determine whether operability could be based on this examination. Prior studies were performed on dogs to perfect the technique, with special regard to the significance of normal variations and the effects of mechanical pressure on the splenic and portal veins. In patients with gastric carcinoma, radical resection was deemed possible if the splenoportogram showed no abnormalities or only mild degrees of stricture or simple reflux. With moderate degrees of stricture or constrictive kinking of the portal or splenic veins, resectability was dependent on the area of the radiographic changes. Radical resection was possible with changes limited to the tail of the pancreas, but was not possible in cases of broad stricture, infiltrative stricture, or extensive collateral circulation. In patients with pancreatic carcinoma, resection was usually possible with mild to moderate degrees of pressure stricture, but was not possible in the presence of more advanced changes. Radical resection in patients with biliary tract carcinoma was possible only when the stricture was still mild in degree. Difficulty was encountered in determining the resectability of carcinoma of the liver (both primary and metastatic) due to the infrequent changes in the splenoportogram even with large intrahepatic masses.

220 STUDIES ON INTESTINAL DIGESTION OF STARCH IN MAN. III. THE ABSORPTION COEFFICIENT OF STARCH IN INFANTS AND CHILDREN.

(E.) Auricchio, S. (Inst. Child Welfare U. Naples, Italy), F. Ciccimarra, A. Rubino and A. Prader. *Enzym Biol Clin (Basel)* 9(5):321-337, 1968.

A method is described for the assay of starches in food and feces based on the hydrolysis of the starch by *Rhizopus delemar* glucoamylase (Sumizyme). The method was applied to the determination of the absorption coefficient of starch in normal diseased children (pancreatic fibrosis and celiac disease). Compared to other methods for starch assay, the Sumizyme method is both simpler to perform and more specific since Sumizyme has no lactase activity and very low sucrase activity. Studies on 5 normal infants at 4, 5 and 7 months of age and 17 normal children 14-28 months old indicated that the intestinal digestion of starch is very efficient. Daily fecal starch and glucose excretions higher than 700 mg and 140 mg, resp., and an absorption coefficient for starch below 99% in 1-2 yr old children can be regarded as abnormal. In some cases of pancreatic fibrosis and celiac disease, starch malabsorption was observed. A severe deficiency of pancreatic amylase appeared to be necessary, however, to cause severe starch malabsorption. No correlation between fecal starch and fat excretion was found in either pancreatic fibrosis or celiac disease.

221 INTRAMUSCULAR PENTAGASTRIN COMPARED WITH OTHER STIMULI AS TESTS OF GASTRIC SECRETION: A MULTICENTRE STUDY.

(E.) Forrest, A. P. M. (Med. Sch., U. Cardiff, Wales), J. R. Kirkpatrick, J. H. Lawrie, G. Gillespie, I. E. Gillespie, V. I. McCusker, H. T. Debas, A. Cox, J. H. Goudie, R. B. Welbourn, I. D. A. Johnston, J. Spivey, C. W. Venables, R. W. G. Johnson, E. Boutchardt, D. Johnston, K. Jepson, J. Lari and H. L. Duthie. *Lancet* 1(7590):341-343, 1969.

Each of 204 men had 2 tests of gastric secretion, one with pentagastrin i.m. (6 μg/kg) and another with one of the following: histamine s.c. (40 μg/kg), histamine i.v. (40 μg/kg/hr), 'Histalog' s.c. (2 μg/kg), pentagastrin s.c. (6 μg/kg), or pentagastrin i.v. (6 μg/kg/hr). Gastric secretions were aspirated via nasogastric tube after an overnight fast, over various time intervals, and the volume and acid content of each sample were measured. The correlation coefficients between paired tests with i.m. pentagastrin and the other stimulants were all significantly different from zero ($p < 0.001$). The lowest (0.66) being obtained with histamine s.c. and the highest (0.87) with histamine i.v. The mean acid outputs with pentagastrin i.m. were slightly lower than in the corresponding standard tests, since the peak acid output with pentagastrin i.m. was not achieved in 10-30 min but in 20-40 min (in 22 of 85 subjects tested). The mean difference between the 10-30 min output and the peak output with pentagastrin i.m. was 0.9 mEq/hr. No side effects were seen with pentagastrin i.m. or i.v. The short (30 min) i.m. pentagastrin test is an adequate method for the diagnosis of achlorhydria and discrimination between high and low acid secretors.

222 COMPARISON OF THE DIAGNOSTIC ACCURACY OF LIVER SCANS, LIVER FUNCTION TESTS AND LIVER BIOPSIES.

(E.) Ferrante, W. A. (Ochsner Clin., New Orleans, La.) and W. S. Maxfield. *Southern Med J* 61(12):1255-1263, 1968.

The diagnostic accuracy of the hepatic scan was compared with that of individual liver function tests, a "battery" of liver function tests, and percutaneous needle biopsy in 14 normal subjects and 86 patients with histologically proven hepatic disease (cirrhosis in 32, metastatic cancer in 25, hepatic abscess in 11, hepatoma in 9, hepatitis in 3, amyloidosis in 1, and granulomatous hepatic disease in 5). The single most accurate diagnostic test was biopsy (92% diagnostic accuracy with only 4 of 50 false negative results). The accuracy of scintillation scanning for detection of hepatic disease (90% in 100 cases with 5 false positives and 5 false negatives) was greater than that of the BSP (79%), SGOT (76%) or alkaline phosphatase (73%), while its accuracy in indicating the specific type of disease was 71%. Most of the errors with the liver function tests were false negative results. Of 77 patients who had a "battery" of liver function tests, the diagnostic accuracy (90%) was comparable to that of biopsy (93%) and greater than that of scanning (78%). In diffuse disease of the liver scanning was much less accurate (73%) than biopsy (100%) or a series of liver function tests (91%). With large hepatic masses, the scan was an accurate (84%) as biopsy (82%), but less accurate than the liver "battery" (92%). The highest percentage of inaccurate scanning diagnoses was due to false positive results, and the accuracy was limited chiefly by difficulty in differentiating between cirrhosis and metastasis. The combined use of both a liver "battery" and scanning, or using the scan to select the site for biopsy will provide a higher degree of accuracy than any parameter alone.

223 LIVER SCANNING FOR DETECTION OF COLLATERAL CIRCULATION IN LIVER DISEASE: A SURVEY OF 567 HEPATIC PHOTOSCANS.

(E.) Johnson, R. B. (Natl. Naval Med. Ctr., Bethesda, Md.), D. O. Castell and W. M. Lukash. *JAMA* 207(3):528-532, 1969

A total of 567 hepatic scans with ^{198}Au were reviewed to determine whether the abnormalities seen in the presence of hepatic collateral circulation occur only in patients with fibrot liver disease. Of the 567 scans studied, 516 revealed either a normal hepatic uptake or the pattern of space-occupying lesion from metastatic disease. Liver mottling and either splenic uptake, bone marrow uptake or both were present on 51 liver scans, including 36 with hepatic cirrhosis, 7 with extrahepatic malignancy, and 1 each with acute hepatitis, chronic hepatitis, chronic lung disease, and hereditary hemorrhagic telangiectasis When the total score on the scan is 5 or greater, the presence of collateral circulation is fairly definite in patients with hepatic cirrhosis. In the present study, 24 patients had a liver scan with a total score greater than 4. This group included 21 patients with cirrhosis, 1 with metastatic malignancy, 1 with lymphoma, and 1 with hereditary hemorrhagic telangiectasis. Portal-systemic shunting is thus most common in cirrhosis or in noncirrhotic patients with portal hypertension. It is urged that the region of the spleen be routinely included during liver scanning.

24 ***IN VIVO* STUDY OF THE INFLAMMATORY BASOPHILIC RESPONSES IN MUCOSAL COLITIS AND TRANSMURAL COLITIS.** *(E.)* Tung, K. S. K. Cleveland Clin. Found., Ohio) and W. A. Hawk. *Amer J Gastroent* 50(6):431-441, 1968.

n order to evaluate the skin window test as a possible clinical echnique for the differential diagnosis of mucosal colitis (ulerative colitis, MC) and transmural colitis (Crohn's disease; TC), he basophilic response elicited by diphtheria toxoid over a eriod of 50 hr was determined in the cellular exudate from 0 patients (8-84 yr old) with MC (15 men and 18 women) or C (16 men and 11 women) and from 17 healthy controls 8 men and 11 women, 19-58 yr old). Among 25 patients who ad received no immunosuppressive therapy, 5 of 13 with MC ut only 2 of 12 with TC had inflammatory basophilia (20 or ore basophils per coverslip), compared with 7 of 17 controls. he basophil counts ranged from 25 to 185 and were usually aximal near the 48th hr. Most basophils appeared degranulated nd were commonly found at the periphery of the cellular ag-egates. There was little or no basophilic response in the other 8 patients (8 with MC and 10 with TC) or 10 controls. Adeno-rcinoma of the colon was found in one patient without a asophilic response and systemic lupus erythematosus in another; of 9 TC patients studied had granulomata. The skin window st therefore appears to be of little value in differentiating be-veen patients with MC and TC. In addition, the long period quired by this technique tends to preclude routine laboratory e. The inhibitory effect of ACTH and prednisone on cellular flammatory response was supported by the lack of basophilic sponse in treated patients.

25 **REASONS FOR INCOMPLETE PROCTOSCOPY.** *(E.)* Salazar, M. (Mayo Grad. Sch. Med., Rochester inn.) and R. J. Jackman. *Dis Colon Rectum* 12(1):19-21, 969.

easons for incomplete passage of the proctoscope (insertion less than 20 cm) were studied in 1113 consecutive ambula-ry nonhospitalized patients (643 males and 470 females, 16- yr old). About one-half of the patients were examined for ssible asymptomatic polyps or early carcinoma, while the maining patients had various lower-bowel complaints. A larger rcentage of males than females could be completely scoped. ere were 277 incomplete examinations (115 males and 162 males). The reasons for these incomplete procedures included rious pathological conditions (sigmoid diverticulosis, previous rgery on the lower bowel, or malignant or inflammatory ictures), anatomical variations, psychological factors, and ssibly combinations of anatomical and psychological factors.

26 **UREA KINETICS AND THE DIRECT MEASUREMENT OF THE SYNTHETIC RATE OF ALBUMIN ILIZING [C^{14}] CARBONATE.** *(E.)* Jones, E. A. (Royal Free Hosp., London, England), A. Craigie, A. S. Tavill, W. Simon and V. M. Rosenoer. *Clin Sci* 35(3):553-564, 1968.

Tracer experiments using isotopically labelled urea and bicarbonate were performed in 2 normal and 13 diseased human subjects in order to test the validity of the working assumptions of the ^{14}C-carbonate method for measuring the synthesis rate of albumin *in vivo*. While the rate of disappearance from the plasma and the renal clearances of simultaneously administered (i.v.) ^{14}C urea and ^{13}C urea were not significantly different, the rate of disappearance from the plasma of i.v. administered ^{13}C urea was significantly greater than that of biosynthesized ^{14}C urea urea following i.v. injection of ^{14}C carbonate. The assumption that there is flash labelling of the hepatic precursor pool of arginine is therefore invalid. The rate of disappearance of ^{14}C bicarbonate from the blood was sufficiently slow to account for some continuing incorporation of label into arginine. A more satisfactory method for determining the total radioactivity incorporated into urea and albumin involves defining the curves of appearance of ^{14}C urea and ^{14}C albumin in the plasma following the ^{14}C carbonate administration, and then correcting these curves for losses of labelled molecules from the plasma by reference to the curves of disappearance from the plasma of simultaneously injected ^{13}C urea and ^{131}I-albumin. The disappearance of labelled urea curves from the plasma can be almost completely described by 2 exponential functions. A method of calculating the absolute rate of urea synthesis which incorporates multi-exponential analysis of these curves is described.

227 **THE EARLIER DIAGNOSIS OF STOMACH CANCER.** *(E.)* Hoon, J. R. (Sheboygan Clin., Wis.). *Arch Surg* 98(2):144-149, 1969.

Newer techniques for the early diagnosis of stomach cancer are described on the basis of experience at the Sheboygan Clinic and a review of the literature. These techniques include gastroscopy using the fiberscope, direct photography of the mucosa using the gastrocamera, exfoliative cytology and biopsy. The problem remains, however, of obtaining earlier referral of subjects with minimal stomach complaints suitable for these examinations. Among 637 patients examined with the gastrocamera during the period 1964-67 (501 for diagnostic purposes), 20 were found to have stomach cancer. These 20 cancers, included 8 which had not previously been identified by X-ray, and one early cancer (malignant transformation) in a patient with severe polypoid gastritis. Ten case reports are presented in detail, including one in which the gastrocamera provided the correct diagnosis of benign ulcer in a patient with suspected malignancy. It is also pointed out that 23 of 68 patients in this series with gastric ulcers and 4 of 10 with gastric polyps, all diagnosed by gastrocamera, had “normal or negative“ gastric X-rays.

228 **ANGIOGRAPHY IN ABDOMINAL TRAUMA.** *(E.)* Redman, H. C. (Wayne County Gen. Hosp., Eloise, Mich.), S. R. Reuter and J. J. Bookstein. *Ann Surg* 169(1):57-66, 1969.

Angiography was used as part of the evaluation of 29 patients with abdominal trauma to define the nature and extent of visceral injury. Of the 29 patients, 12 had normal angiograms. These patients were all treated conservatively and their subsequent course confirmed the angiographic impression. Thus, no known false-negative results were obtained, and unnecessary surgery was avoided in 12 cases. Positive angiograms indicated 8 splenic, 6 renal, and 3 liver injuries in 17 patients. Sixteen were operated on following angiography, while 1 patient with renal damage was treated conservatively. The operative findings confirmed the angiographic diagnosis in all but 1 patient, who had suspected splenic damage. The angiographic diagnosis of visceral injury was thus correct in 28 of 29 patients, compared to 10 correct clinical diagnoses and 12 correct diagnoses by conventional X-ray.

229 AN EVALUATION OF THE RADIO-OPACITY OF VARIOUS INGESTED FOREIGN BODIES IN THE PHARYNX AND ESOPHAGUS.

(E.) Campbell, D. R. (Victoria Gen. Hosp., Halifax, N. S., Canada), B. S. J. Brown and J. S. Manchester. *J Canad Ass Radiol* 19(4):183-186, 1968.

The relative radio-opacity of bone specimens (about 2-3 cm long and up to 4 mm wide) from pork chop, chicken, haddock, herring, young chicken, lamb chop, lobster shell, ham, cod and halibut, enclosed in water-filled, nonopaque, plastic nasogastric tubes, was studied in a human volunteer. Anteroposterior and lateral plain radiographs of the pharynx and cervical esophagus and right posterior oblique radiographs of the thoracic esophagus were made, using standard exposures at 72 inches, without a Bucky diaphragm. Lobster shell was the only specimen visualized in the anteroposterior projection. In the lateral projection, only pork chop, lamb and ham bones were visible in the cervical esophagus, while in the thoracic esophagus, pork chop was the only foreign body visualized. It is concluded that plain radiographs of the cervical and thoracic esophagus in the anteroposterior projection are of little value in the diagnosis of ingested foreign bodies due to the superimposition of the vertebral column. Before resorting to the use of contrast media, however, lateral and oblique radiographs of the cervical and thoracic esophagus, resp., are advisable.

230 ESOPHAGOSCOPY WITH THE FLEXIBLE FIBEROPTIC ESOPHAGOSCOPE: REPORT OF 105 EXAMINATIONS.

(E.) Friedman, H. B. (Cleveland Clin., Ohio) and B. H. Sullivan Jr. *Gastroint Endosc* 15(2):96-99, 1968.

The LoPresti fiberoptic esophagoscope was used to perform 105 examinations in 101 patients; 28 patients were examined with the Eder-Hufford esophagoscope immediately prior to examination with the LoPresti instrument and 22 patients underwent gastroscopy immediately after esophagoscopy. Of 30 patients initially thought to have hiatus hernia, 15 were found to be normal, 9 had hiatus hernia while 5 had incompetence of the cardiac sphincter with reflux esophagitis; there were 4 unsuccessful examinations and 1 perforation. Of 29 patients with cirrhosis thought to have esophageal varices, 6 were normal and 22 had varices; there was 1 case of perforation. Of 15 patients with upper gastrointestinal hemorrhage, esophagoscopy was normal in 6, 2 had esophagitis or gastritis, 3 had hiatus hernia, and 4 had esophageal varices; one examination was unsuccessful. Of 14 patients thought to have obstructive esophageal lesions, 2 were normal, 1 had hiatus hernia, 2 had carcinoma of the cardia of the stomach, 2 had strictures, and 4 had esophageal neoplasms; there were 4 unsuccessful examinations in this group. Of 14 patients with dysphagia, 3 were normal, 2 had esophageal varices, and 6 had esophagitis. There were 8 instances in which the diagnosis was not made with the LoPresti instrument but was made with the Eder-Hufford instrument, and 1 case where the diagnosis was not made with the Eder-Hufford instrument but was made with the LoPresti instrument. The advantages of the LoPresti esophagoscope over the Eder-Hufford esophagoscope were better toleration by the patient, greater flexibility, and relatively easier entry into the stomach. The danger of perforation is real, and if difficulty is encountered while passing the LoPresti instrument through the cricopharyngeal sphincter, the Eder-Hufford instrument should be substituted.

231 GALACTOSE TOLERANCE TEST OF LIVER FUNCTION IN PULMONARY HEART DISEASE.

(E.) Thomas, A. J. (Llandough Hosp., Cardiff, Wales) and R. A. Saunders. *Brit Heart J* 31(1):129-132, 1969.

In order to assess liver function, oral galactose tolerance tests were performed in 50 patients with chronic bronchitis and 25 patients with asthma. Lung function tests and electrocardiograms were recorded in all patients, oxygen saturation and the partial pressure of carbon dioxide (P_{CO_2}) were determined in most, the right heart pressure was recorded in 19, and galactose uridyl transferase or galactokinase levels in the red cells were measured in 38 patients. In 34 of 38 patients with chronic bronchitis and forced 1-second expiratory volumes (FEV_1) of less than 1.2 liter, galactose tolerance indices were also abnormal (above 140 U). Of 12 patients with chronic bronchitis and an FEV_1 of 1.2-1.5 liter, 8 had galactose tolerance indices above 140 and 4 had normal values. This suggests that severe chronic bronchitis (FEV_1 <1.2 liter) gives rise to liver function disturbances. Of the 25 patients with severe asthma, 18 had normal galactose indices; of the 7 with values above 140, 5 failed to improve and 2 died. This suggests that in pure asthma, the galactose tolerance test is normal if the ventilatory condition is improving. The galactose index was abnormal in 11 of the chronic bronchitics with associated heart failure, and remained so even after good medical control of the heart failure. Abnormal galactose indices were found in all 30 of the 50 cases of chronic bronchitis with electrocardiograms compatible with pulmonary heart disease; 12 with normal electrocardiograms had abnormal indices and 2 had abnormal electrocardiograms but normal indices. The electrocardiogram was normal in 20 of the 25 asthmatics, but 4 of the asthmatics with abnormal galactose indices had some abnormality in the electrocardiogram. Most subjects with pulmonary hypertension had abnormal galactose indices, but there was no statistical correlation. Most patients with chronic bronchitis were hypoxic but 3 patients with O_2 saturations above 90% had abnormal galactose indices, suggesting that hypoxia is not the full explanation. Six patients with a P_{CO_2} of 40 mm Hg or less had abnormal galactose indices, while 1 patient with a P_{CO_2} of 51 mm Hg had a normal index. Erythrocyte galactose uridyl transferase levels were normal in 32 and only mildly decreased in 6 of 38 patients, indicating that a deficiency of this enzyme is not responsible for the noted abnormalities. It is concluded that the abnormality in liver function in patients with chronic bronchitis is caused by a reduction in hepatic blood flow and the production of hepatic congestion (without heart failure) by the changed intrathoracic pressures affecting venous return and causing an increased pressure in the inferior vena cava.

232 SERUM TRANSAMINASE STUDIES IN SICK AND HEALTHY PERSONS DURING AN

DIAGNOSTIC PROCEDURES

EPIDEMIC OF VIRAL HEPATITIS. *(E.)* Bhattacharji, L. M. (All-India Inst. Hyg. Publ. Health, Calcutta, India) and S. R. Chowdhury. *Indian J Med Res* 56(10):1456-1461, 1968.

During a widespread outbreak of viral hepatitis in Gauhati, Assam in 1965, serum transaminase studies were made on 24 icteric and 20 healthy subjects (15-54 yr old) who lived in some of the affected areas of the city, but had no history of direct exposure to any case of frank jaundice. In 75% of the jaundiced patients, both SGOT and SGPT were above normal; only 2 (10%) of the healthy controls had elevated enzyme levels. The mean SGOT and SGPT values in the jaundiced patients were 361 ± 82 U and 123 ± 27 U, resp.; the corresponding values in the healthy subjects were 15 ± 1.7 and 4.0 ± 0.38 U, resp. The level of transaminase activity was more closely related to the clinical severity of the disease than to its clinical course or duration; poor correlation between liver enlargement and elevated enzyme levels was also noted. In healthy pregnant women (included in the healthy subject group), uncomplicated pregnancy did not produce any increase in enzyme activities.

233 **ESOPHAGEAL MANOMETRY IN SCLERODERMA.** *(E.)* Kaufmann, H. J. (Yale U. Sch. Med., New Haven, Conn.), I. M. Braverman and H. M. Spiro. *Scand J Gastroent* 3(3):246-254, 1968.

Esophageal motility tracings were made in 21 patients (16 females and 5 males, 25-70 yr old) with scleroderma of varyng severity and in normal controls with an open-tipped, tripleumen, water-filled catheter without attached balloon. Lower sphincter abnormalities were present in 8 of the 21 patients: 5 had neither a high pressure zone nor relaxation and 2 showed no dips with swallowing although a 2-4 mm Hg increase in pressure was seen at the hiatus. Peristalsis was absent in 12 patients: 2 showed aperistaltic contractions with 50% of wallows with propulsive contractions in the remaining 50%. Weakness of contraction was present in all 12 with aperistalsis, and in 5 patients, weakness alone was present. In 2 patients, he only abnormality was multiple peaking of contractions n response to swallowing; 1 to 30% and 1 to 33% of swallows. An absent gastroesophageal gradient was noted in 10 of the 21 patients and in 4 of the normal controls: it was the only abnormality in 1 patient, associated with weakness in 2, and with weakness and aperistalsis in 7. A normal upper sphincter was een in all subjects. Since most of the abnormalities seen are nonspecific, scleroderma can be diagnosed manometrically only when very marked changes coupled with a negative Mecholyl est are present.

34 **ISOZYME VARIATIONS OF SERUM ALKALINE PHOSPHATASE AND NAPHTHYL AMIDASE N BILIARY AND GASTROINTESTINAL DISEASE.** *(E.)* Beckman, L. (Dept. Genetics, U. Hawaii, Honolulu), G. Beckman and S. Dahlgren. *Scand J Gastroent* 3(3):241-245, 1968.

Electrophoretic variations in serum alkaline phosphatase and naphthyl amidase (leucine aminopeptidase) were studied in hospitalized patients with biliary, gastrointestinal and a variety of other diseases. All hospitalized patients had very low levels of intestinal alkaline phosphatase as compared to healthy subjects. The electrophoretically faster-moving serum alkaline phosphatase showed more variability than in normal adult individuals: type 3 was more common in patients with biliary disease than in any of the other groups, and was rarely found in normal individuals. High amounts of zone B naphthyl amidase were also more frequent in patients with biliary disease. The frequency of naphthyl amidase was noted to increase as the amount of liver alkaline phosphatase increased. It is suggested that the dependence of intestinal alkaline phosphatase on blood groups and dietary factors limits its utility in clinical diagnosis, whereas the simultaneous increase of liver alkaline phosphatase and naphthyl amidase seems to be a reliable indication of biliary disease.

235 **MEASUREMENT OF CENTRAL VENOUS PRESSURE: COMPLICATIONS AND POSSIBLE FAILURES OF THE METHOD.** *(E.)* Andersen, A. (Bispebjerg Hosp., Copenhagen, Denmark) and J. G. Klebe. *Scand J Gastroent* 3(3):267-272, 1968.

Measurements of central venous pressure (CVP) were performed in 142 patients with massive gastrointestinal hemorrhage. Mild phlebitis at the catheter site developed in 7 patients and severe phlebitis occurred in 6 patients. Pulmonary embolism occurred in 8 patients, but the CVP catheter was not a likely cause of these emboli. In 6 of 7 patients who developed pulmonary congestion, the CVP gave ample warning and in the remaining patient the placement of the catheter in a peripheral vein gave falsely low values for the venous pressure. Despite the CVP monitor, 6 patients died from exsanguination, although the CVP correctly indicated the circulatory condition. It is felt that the measurement of CVP is not accompanied by complications which make its use dangerous, and that it gives adequate warning against circulatory overload and exsanguination.

236 **SURFACE MICROSCOPIC AND HISTOLOGIC APPEARANCES OF THE GASTRIC MUCOSA.** *(E.)* Burhol, P. G. (Ulleval Hosp., Oslo, Norway). *Scand J Gastroent* 3(3):317-320, 1968.

Suction biopsies from the fundus or body of the stomach were obtained with a Crosby-Kugler capsule in 72 patients with dyspepsia (17 women and 55 men, 27-77 yr old); specimens were evaluated by surface and light microscopy (magnifications of 30x and 150x, resp.). Surface microscopy revealed a normal gastric mucosa in 23, superficial gastritis in 27, and atrophic gastritis in 22 patients. Light microscopy confirmed the diagnosis in 61%, 89%, and 91%, resp. It is concluded that surface microscopy enables the diagnosis of gastritis to be made quickly in a fairly high proportion of patients.

237 **ESTIMATION OF MAXIMAL GASTRIC ACID SECRETORY CAPACITY AFTER AUGMENTED HISTAMINE STIMULATION.** *(E.)* Christiansen, P. M. (Bispebjerg Hosp., Copenhagen, Denmark) and P. Rodbro. *Scand J Gastroent* 3(3):305-316, 1968.

The maximal gastric acid secretion was determined in 182 patients (126 males and 56 females; 95 with duodenal ulcer, 50 with gastric ulcer, and 37 with gastritis) and in 35 healthy subjects (22 males and 13 females) examined with the augmented histamine test as well as in 5 normal volunteers (1 male and 4 females) examined 43 times with both the augmented histamine test and i.v. histamine infusion. The augmented histamine test was performed by collecting basal gastric secretions for 1 hr followed by histamine (40 μg/kg s.c.). Gastric juice was then collected for 4 15-min periods. In the i.v. histamine infusion test, performed 45-60 min after an augmented test, histamine (37.5 μg/min) was continuously infused for 3 hr; gastric juice was collected at 15-min intervals. In 2 of the controls, dose-response tests were performed with i.v. histamine dosages ranging from 3.3 to 83.5 μg/min. With the augmented test, the maximum 30-min secretion was in the 15-45 min period in 66.4% (144 of 217) of all subjects tested. In normal volunteers, volume secretion was maximal in the 2nd 15-min period and maximal acidity and output were seen in the 3rd 15-min period with the augmented histamine test; with i.v. infusion, maximal volume secretion and acid output occurred during the 4th 15-min period, and maximal acidity occurred after the 10th 15-min period. The maximal acidity and volumes and maximal 15-min volumes and acid outputs in the histamine infusion test did not differ significantly from those with the augmented test. In the dose-response experiments, maximal acid outputs occurred with doses of 10.2 and 11.0 μg of histamine/min in the 2 subjects, resp. It is recommended that the augmented histamine response calculated from the 15-45 min period of the augmented histamine test be used in gastric secretory studies in clinical practice.

238 AN EVALUATION OF A SIMPLIFIED TECHNIQUE FOR COLONIC EXFOLIATIVE CYTOLOGY. *(E.)* Miller, D. F. (Griffin Hosp., Derby, Conn.), J. J. Sikorski, M. M. Moritz and V. A. DeLuca Jr. *Acta Cytol* 13(1):53-56, 1969.

The accuracy of a simplified technique for colonic cytology and the quality of the material collected by this method was evaluated by comparing the cytologic diagnosis with the clinical state of 127 patients. A total of 140 specimens were examined. Each patient received a low-residue diet for 2 days, a laxative and a saline enema the night before the collection followed by a single diagnostic saline enema which was retained for 5 min while the abdomen was massaged. Washings were then collected and the mucous strands were smeared and prepared for cytologic examination. The material was divided into 4 groups: group I was considered normal; group II was considered abnormal but not malignant; group III was suspicious for malignancy; and group IV was malignant. All subjects had extensive gastrointestinal studies, including barium enema and sigmoidoscopic examinations, and tissue biopsies or laparotomies in some. A close follow-up for 1-3 yr was available on all patients. Among the 117 specimens in groups I and II, the clinical diagnosis was correct in 98% (114 benign and 3 malignant); among 6 in group III, there were 5 clinically benign and 1 malignant lesions; among 17 in group IV, the clinical diagnosis was correct in 77% (4 benign and 13 malignant). The material obtained by this method was generally of good technical quality and permitted a high degree of diagnostic accuracy.

239 THE CLINICAL VALUE OF STUDYING THE ACTIVITY OF LACTIC DEHYDROGENASE (LDH) ISOENZYMES IN SOME SURGICAL DISEASES OF ORGANS IN THE ABDOMINAL CAVITY. *(Rus.)* Markelov, I. M. (S. M. Kirov Acad. Milit. Med., Leningrad, USSR), Ie. A. Khvatova and G. A. Baklanova. *Klin Khir* (10):27-31, 1968.

Total LDH activities and LDH isoenzyme levels were determined in serum from patients with pancreatic and biliary tract diseases and in liver and pancreatic tissue from autopsied patients. Serum LDH$_{1-3}$ levels were increased in patients with necrotic pancreatitis. Total serum LDH activities decreased after surgery and returned to normal 30 days later. LDH$_{1-2}$ levels increased beyond their initial values in patients who developed infections or necrosis of the pancreas after surgery. Serum LDH$_5$ levels were increased in patients with pancreatic edema, in 5 of 15 conservatively treated patients with acute pancreatitis, in obstructive jaundice due to neoplasms, in biliary cirrhosis, and in pancreatic tumors. Patients with acute pancreatitis associated with cholelithiasis had elevated LDH$_{1-3}$ and LDH$_5$ levels. LDH$_{3-5}$ levels were elevated in patients with acute cholecystitis. The most marked changes, particularly increased LDH$_5$ levels, occurred in patients with perforative cholecystitis and localized biliary peritonitis.

240 ANGIOGRAPHY IN DISEASES OF THE GASTROINTESTINAL TRACT. *(E.)* Sybers, R. G. (Emory U. Sch. Med., Atlanta, Ga.) and J. T. Galambos. Pp. 473-501 in *Progress in Gastroenterology.* Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

241 RE-EVALUATION OF CYTOLOGIC METHODS IN THE DIAGNOSIS OF MALIGNANT LESIONS OF THE STOMACH. *(E.)* Vilardell, F. (Santa Cruz y San Pablo Hosp., Bracelona, Spain). Pp 129-156 in *Progress in Gastroenterology.* Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

242 GASTROPHOTOGRAPHY AND CINEGASTROSCOPY. *(E.)* Colcher, H. (Columbia-Presbyterian Med. Ctr., New York City). Pp 97-128 in *Progress in Gastroenterology.* Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

243 THE VALUE OF SPLENOPORTOGRAPHY IN THE DIAGNOSIS OF HYDATID CYSTS OF THE LIVER. *(Sp.)* Grinfeld, D. *Prensa Med Argent* 55(28): 1340-1342, 1968.

244 ANGIOGRAPHY AND SCINTILLATION SCANNING IN THE DIAGNOSIS OF HEPATIC HYDATIDOSIS. *(Sp.)* Martella, M. (Rawson Hosp., Buenos Aires, Argentina), R. Rostagno, J. Salvidea, R. Garriz and V. Caride. *Prensa Med Argent* 55(28):1372-1373, 1968.

245 THE ROLE OF SCINTILLATION SCANNING IN COMBINATION WITH SPLENOPORTOGRAPHY IN CHRONIC DISEASES OF THE LIVER. *(Rus.)* Loginov, A. S. (All-Union Sci.-Res. Inst. Gastroent., Moscow, USSR), L. S. Matveieva and O. P. Petrova. *Klin Med (Moskva)* 46(10):94-98, 1968.

246 CORRELATIONS BETWEEN CLINICAL AND LABORATORY DATA: LIVER BIOPSY. *(Sp.)* Perez Grovas, P. (Clin. Lab., Mexico City, Mexico). *Prensa Med Mex* 33(9/10):324-325, 1968.

247 THE X-RAY DIAGNOSIS OF REFLUX ESOPHAGITIS IN PATIENTS WITH HIATUS HERNIA. *(Rus.)* Arablinskii, V. M. (Sci.-Res. Inst. Clin. Exp. Surg., Min. Health USSR, Moscow). *Vestn Rentgen Radiol* 43(5):44-48, 1968.

48 **THE VALUE OF TOMOGRAPHY IN EXAMINATION OF THE BILE DUCTS.** *(Rus.)* Shpil't, . M. (Berdichevsk Munic. Hosp., USSR). *Vestn Rentgen adiol* 43(5):48-52, 1968.

49 **THE RADIOLOGICAL DIAGNOSIS OF RETROGRADE INTUSSUSCEPTION AS ILLUSTRATED Y THE FINDINGS IN CECOILEAL INTUSSUSCEPTION.** *Ger.)* Heinisch, H. M. (Pediat. Clin., U. Cologne-Lindenthal, ermany) and A. Kallenberg. *Z Kinderheilk* 104(4):257-267, 968.

50 **MASSIVE GASTROINTESTINAL HEMORRHAGES: EMERGENCY DIAGNOSIS BY ELECTIVE ARTERIOGRAPHY.** *(Fr.)* Opolon, P. (St. ntoine Hosp., Paris, France), M. Hivet, J. P. Chevrel, J. C. henard, F. Mussy and J. Caroli. *Arch Franc Mal Appar Dig* 7(10):789-800, 1968.

51 **ESOPHAGOGASTROSCOPY IN THE DIAGNOSIS OF GASTROINTESTINAL HEMORRHAGE.** *us.)* Struchkov, V. I. (I. M. Sechenov 1st Moskow Med. Inst., SSR), A. V. Grigorian, E. V. Lutsevich and I. N. Belov. *hirurgiia (Moskva)* 44(8):78-82, 1968.

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53 **CYTOLOGICAL EXAMINATION IN GASTROINTESTINAL TRACT DISEASE.** *(E.)* Brandorg, L. L. (U. California Sch. Med., San Francisco) and J. enger. *Med Clin N Amer* 52(6):1315-1328, 1968.

54 **LIVER SCAN IN THE DIAGNOSIS OF RUPTURED RIGHT HEMIDIAPHRAGM WITH ERNIATION OF THE LIVER.** *(E.)* Armstrong, R. G. ilford Hall USAF Hosp., Lackland Air Force Base, Tex.), . N. Dooley and R. H. Hood. *Ann Thor Surg* 6(5):480-483, 968.

5 **PENTAGASTRIN VS STIMULANT OF GASTRIC SECRETION: COMPARATIVE STUDY IN MAN.** *.)* Isenberg, J. I. (U. California Sch. Med., Los Angeles), . M. Brooks and M. I. Grossman. *JAMA* 206(13):2897-2898, 68.

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7 **LAPAROSCOPY IN ABDOMINAL EMERGENCIES.** *(Fr.)* Paolaggi, J. A. *Vie Med (Spec)* :1333-1342, 1968.

8 **FUNCTIONAL INVESTIGATION OF THE SMALL INTESTINE.** *(Fr.)* Duchier, J. *Vie Med (Spec)* :1233-1264, 1968.

9 **THE LABORATORY IN THE DIAGNOSIS OF VIRAL HEPATITIS.** *(It.)* Valerio, V. and E. ala. *Haemat Lat* 11(suppl. 3):69-106, 1968.

260 **HIGH DOSE PERCUTANEOUS TRANSPLENIC PORTAL VENOGRAPHY.** *(E.)* McNulty, J. G. (Royal Free Hosp., London, England). *Brit J Radiol* 41(481): 55-58, 1968.

261 **A SIMPLIFIED METHOD FOR THE DETERMINATION OF PEPSINOGEN IN BLOOD AND URINE.** *(E.)* Uete, T. (Tazuke Kofukai Med. Res. Inst., Osaka, Japan), M. Wasa and A. Shimogami. *Clin Chem* 15(1): 42-55, 1969.

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263 **THE USE AND ABUSE OF LABORATORY TESTS.** *(E.)* Russe, H. P. (Loyola U. Stritch Sch. Med., Hines, Ill.) *Med Clin N. Amer* 53(1):223-231, 1969.

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GASTROINTESTINAL DISEASES

ESOPHAGUS

308 ROLE OF VAGOTOMY AND PYLOROPLASTY IN THE THERAPY OF SYMPTOMATIC HIATUS HERNIA. *(E.)* Pearson, F. G. (Dept. Surg., U. Toronto, Canada), R. M. Stone, R. M. Parrish, R. E. Falk and W. R. Drucker. *Amer J Surg* 117(1):130-137, 1969.

Symptomatic recurrence, radiological recurrence, postvagotomy diarrhea, and postpyloroplasty dumping were investigated in 137 patients, aged 20-76 yr, with symptomatic hiatus hernia. These included: 1) 70 with associated duodenal ulcers subjected to vagotomy, pyloroplasty, and repair of the hernia; 2) 17 with symptomatic hiatus hernia alone subjected to the same procedures; and 3) a control group of 50 managed by hernia repair alone. Although there were no significant differences between the groups in the incidence of symptomatic recurrences, the incidence of radiological recurrences was higher among patients undergoing vagotomy and pyloroplasty. This may be a result of the abdominal approach used for nearly all these patients. Eight of the 87 patients in groups (1) and (2) complained of postvagotomy diarrhea or postpyloroplasty dumping (9%). These results suggest that vagotomy and pyloroplasty should be used in addition to hernia repair only: 1) if there is an associated ulcer; 2) if peptic esophagitis has caused such shortening of the esophagus that it is necessary to divide the vagus nerves to add sufficient length and permit reduction of the hernia without tension; and 3) in the management of recurrent hiatus hernia if the vagus nerves have been divided in an attempt to mobilize the esophagus.

309 REAPPRAISAL OF THE BALANCED OPERATION FOR SLIDING ESOPHAGEAL HIATAL HERNIA. *(E.)* Meads, G. E. Jr. (Vanderbilt U. Med. Ctr., Nashville, Tenn.) and J. L. Sawyers. *Amer J Surg* 117(1):124-129, 1969.

Results of surgery are presented for 66 patients (28 men and 38 women, 19-79 yr old) with hiatal hernia who failed to improve on a medical regime. Associated gallbladder disease or peptic ulcer was present in 37 (56%); one patient had hiatal hernia, peptic ulcer, and chronic cholecystitis; one a benign esophageal leiomyoma; and another, a malignant colonic polyp. The operation consisted of hernia repair, truncal or selective gastric vagotomy, esophagogastropexy to restore the esophagogastric angle, pyloroplasty or antrectomy, and correction of associated conditions. Only 4 patients had radiologically detected recurrences, 2 of which were asymptomatic, and esophageal reflux without recurrence of the hernia occurred in 4 more. Surgery completely relieved the original symptoms in 46 patients who had no postvagotomy symptoms either. Seven patients had occasional episodes of epigastric pain and pyrosis which were controlled by diet and antacids. Ten patients had mild to moderate symptoms attributed to vagotomy and drainage procedures, but none were incapacitated.

310 ESOPHAGEAL AND PULMONARY DISTURBANCES IN MYOTONIA DYSTROPHICA. *(E.)* Garrett, J. M. (U. Alabama Med. Ctr., Birmingham), T. D. DuBose Jr., J. E. Jackson and J. R. Norman. *Arch Intern Med* 123(1):26-32, 1969.

An attempt to correlate esophageal motility and pulmonary function was made in 13 patients (11 men and 2 women, 17-57 yr old) with myotonia dystrophica. Altered esophageal motility with decreased amplitude and frequency of contractions after swallowing, was apparent in all patients, but symptoms of dysphagia, found in 6 cases, could not be correlated with motility disturbances or the duration of the illness (4-23 yr). Pulmonary function was less impaired, but significant functional changes were found in most patients. Pulmonary infections were common and 1 patient died of aspirational pneumonia and respiratory failure during the study. Myotonia dystrophica frequently causes alterations in pulmonary function and pharyngoesophageal motility, although the latter could not be correlated with pulmonary functional changes in this study.

311 MANAGEMENT OF ESOPHAGEAL PERFORATION. *(E.)* Youngs, J. (Dept. Surgery, U. Minnesota, Minneapolis) and D. Nicoloff. *Surgery* 65(2):264-268, 1969.

Nineteen cases of esophageal perforation (18 men and 1 woman, 21-83 yr old) seen at the Minneapolis VA Hospital during the period 1952-66 are reviewed with respect to primary diagnosis, etiology and position of the perforation, method of treatment and mortality. The most frequent signs of perforation were fever (18 cases), pain (12 cases) and s.c. emphysema (6 cases). The causes of perforation included esophagoscopy and biopsy (11 cases), esophageal dilatation (3 cases), Mackler tube insertion (2), gastroscopy (1), foreign body (1) and spontaneous rupture due to alcoholism (1). Nine perforations occurred in the lower third of the esophagus (mortality rate 11%), 4 in the middle third (mortality rate 25%) and 6 in the cervical esophagus (mortality rate 50%). Among 11 patients initially given medical treatment (antibiotics, nasogastric suction and bed-rest beginning 12-48 hr after perforation), the mortality rate was 36%; 6 of these 11 subsequently required surgical treatment within 24-72 hr, with a mortality rate of 67%. In contrast, only 1 of 8 patients treated surgically as soon as a diagnosis of perforation was made died (average of 20-hr interval between perforation and surgery). Perforation was located in the lower third of the esophagus in 7 of these 8 cases. The results demonstrate the consequence of delayed surgical drainage; the relation between site of perforation and mortality cannot be assessed since the 3 patients who died after cervical perforation all had delayed surgical drainage.

312 A RATIONAL PROGRAM FOR THE DIAGNOSIS AND TREATMENT OF BLEEDING ESOPHAGEAL VARICES. *(E.)* Conn, H. O. (VA Hosp., West Haven, Conn.) and J. A. Simpson. *Med Clin N Amer* 52(6):1457-1474, 1968.

Based on data from the literature and their own experience during the last 10 yr at the West Haven VA Hospital, the authors carefully review accepted diagnostic and therapeutic measures for hemorrhage from esophageal varices, and outline an effective program intended primarily for patients with Laennec's cirrhosis. Emergency esophagoscopy, which was successfully performed in 142 of 151 patients, proved to be a rapid, safe and reliable means of establishing or excluding esophageal varices

as the site of gastrointestinal hemorrhage. Endoscopic diagnosis was correct in 68 of 78 examinations in which the site of hemorrhage was proved, including all 28 cases of bleeding esophageal varices. Vasopressin therapy provided relatively safe and simple control of bleeding in 12 of 28 cases given multiple doses, and is suggested as the first step in treatment. The Sengstaken and Blakemore tube was associated with fatal complications in about 20% of the patients in whom it was used, and should therefore be reserved for cases proven unequivocally to be bleeding from esophageal varices when bleeding continues in spite of conservative therapy and surgical intervention is impossible. Both published data (uncontrolled) and the authors' experience with 101 patients suggest that emergency portacaval anastomosis offers greater survival than other forms of treatment. Among 18 patients who had emergency portacaval anastomoses, 10 died, while 64 of the remaining 83 patients died of hemor-
rhage or its consequences and 5 of the 19 survivors died later;
the overall mortality was 79%, but 13 of 15 who underwent
elective portacaval shunts survived. Prophylactic portacaval
anastomosis virtually eliminates hemorrhage from varices, but
loes not increase survival in unselected cirrhotic patients. Pre-
liminary results of a controlled study indicate that this procedure
nay improve survival in selected cirrhotics with esophageal
/arices.

313 THE SWALLOWING DISORDER IN PATIENTS WITH DIABETIC NEUROPATHY-GASTRO-
ENTEROPATHY. *(E.)* Mandelstam, P. (U. Kentucky Coll.
Med., Lexington), C. I. Siegel, A. Lieber and M. Siegel.
Gastroenterology 56(1):1-12, 1969.

Ten patients (2 women and 8 men, 27-68 yr old) with diabetic
ieuropathy-gastroenteropathy who had undergone cineradiog-
aphy 9 months to 3 yr earlier for esophageal motor dysfunc-
ion were reevaluated clinically and cineradiographically; mano-
netric studies were also carried out in 8 cases. Individual case
eports are presented. In comparison with an age- and sex-
natched control group, the diabetic patients showed a markedly
iminished amplitude of peristaltic contractions in the pharynx
nd throughout the body of the esophagus; a markedly de-
reased percentage of swallows followed by peristalsis (average
f 45% versus 89% in controls); a high incidence of tertiary
spastic) contractions; and a much reduced resting pressure in
ne lower esophageal sphincter (2 ± 1 mm Hg versus 6 ± 1 mm
Ig in controls). There was substantial overlap between diabetic
nd control groups in the mean duration of pharyngeal con-
actions, mean resting pressure of the upper esophageal sphincter
ean duration of relaxation of the upper esophageal sphincter,
d duration of relaxation of the lower esophageal sphincter.
ineradiography revealed diminished or absent primary peri-
altic waves in all 10 cases, delayed recumbent emptying in 9,
creased esophageal caliber in 9, occasional tertiary contrac-
ons in 5, hiatus hernia and gastroesophageal reflux in 1, and
aryngeal dilatation in 1.

4 EFFECTS OF INCREASED GRAVITY ON GASTROESOPHAGEAL REFLUX IN MONKEYS.
.) Skinner, D. B. (USAF Sch. Aerospace Med., Brooks AFB,
xas) and T. F. Camp Jr. *Aerospace Med* 40(1):14-17, 1969.

ie ability of intraluminal pressure measurements and of the
ndardized gastric reflux technique to predict the competency
the cardia under increased gravitational stress was evaluated
10 sedated Rhesus monkeys (13 mg chlorpromazine). Five animals had reconstruction of the cardia to increase the competency of the gastroesophageal junction. Intraluminal pressure was recorded from the esophagus, sphincter zones and stomach, and esophageal pH was measured under resting conditions and during centrifugation at 2-3 times normal gravity. Four of 5 monkeys which did not show reflux during the control experiments also did not show reflux during centrifugation; 5 monkeys which showed minimal or moderate reflux under normal gravitational conditions had increased reflux when centrifuged. In animals which exhibited a competent cardia, excessive pressure did not develop in the esophagus, while increased gastric pressures were transmitted to the esophagus in animals with slightly or markedly incompetent sphincter mechanisms. Assessment of the sphincter by intraluminal pressure measurements under control conditions did not correlate well with competence of the cardia under increased gravity. However, the standardized test for reflux under resting conditions did permit accurate prediction of sphincter function during centrifugation.

315 INCIDENCE OF HIATUS HERNIA IN ASYMPTOMATIC SUBJECTS.
(E.) Dyer, N. H. (London Hosp., England) and R. B. Pridie. *Gut* 9(6):696-699, 1968.

The incidence of hiatus hernia and its role in the production of symptoms suggestive of gastrointestinal disease was studied by barium swallow in 95 essentially asymptomatic volunteers (61 males and 34 females). The patients were divided into 3 groups on the basis of a personal interview: 59 patients with no symptoms; 36 patients with minor gastrointestinal symptoms, including 24 with upper abdominal and 12 with lower abdominal symptoms; and 32 patients with chest pain, including 12 with ischemic heart disease and 20 with a normal ECG. Of the 95 people examined, 31 had a sliding hiatus hernia, giving an incidence of 33%. Reflux was demonstrated in 5 of these patients but was not demonstrated in any subject in the absence of a hernia. The hernias were all small or medium sized. There was no tendency for the incidence to increase with advancing age. Nearly twice as many males as females were included in the study by chance, but the incidence of hernia in each sex was similar (33% in males and 32% in females). The incidence also did not rise progressively with weight. Minor symptoms were not related to the presence of a hernia and it was not possible to isolate any particular symptom as indicative of hiatus hernia. It appeared initially that hiatus hernia might be associated with ischemic heart disease, but the results were not significant when compared with the group complaining of other types of chest pain.

316 HIATUS HERNIA, DUODENAL ULCER AND PEPTIC ESOPHAGITIS.
(E.) Weber, J. M. (U. Pittsburgh Sch. Med., Pa.). *Amer J Gastroent* 51(1):35-41, 1969.

In a series of 2125 esophagoscopies performed during the period 1951-66, 410 cases of hiatus hernia were encountered. Esophagitis was present in 48, or about 12% of all cases with hiatus hernia. In the majority of patients, hiatus hernia without gastric hypersecretion is a relatively minor anatomic abnormality. Hiatus hernia with gastric hypersecretion, however, especially in the presence of duodenal ulcer (25 of these 48 cases) is a serious problem; it is often associated with gastritis, erosions and ulcers within the hernia, and may develop into peptic esophagitis and stricture. In this group of 48 cases there were 20 without stricture, 23 with soft strictures and 5 with hard undilatable strictures. The soft strictures usually dilate easily, but failure to correct the hiatus hernia and its associated incompetency surgically at this early, reversible stage may lead to Stage III with the hard undilatable strictures requiring more serious surgery. Peptic insult to the lower esophagus may proceed undetected for years; with age, mucosal resistance weakens, leading to esophagitis and stricture. Surgical repair of hiatus hernia should therefore be considered in all cases of esophagitis and in all cases in which hiatus hernia is associated with duodenal or prepyloric peptic ulcer. It is essential that the distal esophagus be restored to its intraabdominal position and that the normal cardioesophageal angle be restored and maintained.

317 **THE DEVELOPMENT OF CANCER IN PATIENTS WITH HIATUS HERNIA.** *(Rus.)* Gvozdev, M. P. (S. M. Kirov Acad. Milit. Med., Leningrad, USSR). *Vestn Khir Grekov* 101(10):19-24, 1968.

Cancer developed in 15 of 367 patients with hiatus hernia, and another patient developed a leiomyoma. Cancer was found in the lower part of the esophagus in 8 cases, in the cardia in 6, and in the body of the stomach in 2. Nine of these patients had sliding hernias and 2, periesophageal hernias. Five young patients had symptoms of reflux esophagitis. Three illustrative case reports are presented. Possible explanations are offered to account for the development of cancer in patients with hiatus hernia. Surgical treatment of hiatus hernia is recommended to prevent the development of gastritis and reflux esophagitis which are considered to be the 2 main causes of cancer in these patients.

318 **THE DIAGNOSIS AND TREATMENT OF BENIGN TUMORS OF THE ESOPHAGUS.** *(Rus.)* Rogacheva, V. S. (Tomsk Med. Inst., USSR) and T. I. Tsekhanovich. *Vestn Khir Grekov* 101(10):16-18, 1968.

Between 1954 and 1967, 14 patients were seen with benign esophageal tumors; operations were performed on 11 (7 men and 4 women, aged 18-56 yr). Correct diagnoses were established before surgery in 9 cases. One patient was erroneously believed to have a mediastinal tumor, and the esophageal tumor of another went undiagnosed because of an esophageal diverticulum. Tumors were enucleated using an abdominal approach in the 6 cases in which they were located in the lower third of the esophagus and a transpleural approach in the 5 cases in which they were located in the upper 2/3. Histological examinations showed that 9 tumors were leiomyomas, 1 was a fibroma, and 1 a cyst. An illustrative case report is presented.

319 **ESOPHAGITIS AND MUCOSAL STRUCTURE.** *(Fr.)* Mounier-Kuhn, P., J. Gaillard, H. Lafon, A. Morgon and J. P. Haguenauer. *J Franc Otorhinolaryng* 17(9):721-729, 1968.

The embryogenesis of the esophagus, esophageal anomalies, clinical findings in nonneoplastic esophagitis, and the pathogenesis of esophagitis are discussed. Responses characteristic of the glandular secretory mucosa of the stomach were obtained in 70 of 82 biopsied cases of "peptic" stenotic esophagitis. These cases are best accounted for by a congenital theory which explains variations in joining, islets or rings of ectopic mucosa, and more or less extensive layers of ectopic tissue in the lower esophagus. A case report is presented for a 54-yr-old alcoholic man who developed esophagitis and gastric mucosa in the esophagus without any signs of malignancy. Treatment consisted of diet and "dressing" of the mucosa. It is concluded that nonneoplastic esophagitis is due to secretory malfunction and intolerance.

320 **THE ESOPHAGUS IN DISEASES OF THE HEART AND AORTA.** *(It.)* Barbaccia, F. (Maggiore Hosp., Milan, Italy). *Minerva Gastroent* 14(2): 33-51, 1968.

321 **RECONSTRUCTION OF THE CERVICAL ESOPHAGUS.** *(Sp.)* O'Conotr, C. M. (Rivadavia Hosp., Buenos Aires, Argentina), E. Córdova, S. Saade and P. Quiroga. *Prensa Med Argent* 55(27):1307-1310, 1968.

322 **POSTOPERATIVE REFLUX ESOPHAGITIS AND ITS TREATMENT.** *(Rus.)* Riabtsev, V. G. (I. M. Sechenov 1st Moscow Med. Inst., USSR), A. L. Grebenev and L. P. Baiandin. *Klin Med (Moskva)* 46(10):98-102, 1968.

323 **THE CLINICAL CHARACTERISTICS OF HIATUS HERNIA.** *(Rus.)* Kunov, A. (Higher Med. Inst., Sofia, Bulgaria), M. Orbetsov, S. Naidenov and F. Avramova. *Klin Med (Moskva)* 46(10):102-108, 1968.

324 **CHANGES IN THE BLOOD PICTURE FOLLOWING CHEMICAL BURNS OF THE ESOPHAGUS.** *(Rus.)* Boris, A. I. (Minsk Med. Inst., USSR) and V. A. Kat'ko. *Klin Med (Moskva)* 46(10):109-111, 1968.

325 **THE PATHOPHYSIOLOGY AND X-RAY DIAGNOSIS OF HIATUS HERNIA.** *(Ger.)* Himmel, D. (Radiol. Clin., Karl Marx U., Leipzig, Germany) and F. Kamprad. *Deutsch Gesundh* 23(45):2119-2126, 1968.

326 **STRANGULATED DIAPHRAGMATIC HERNIA.** *(E.)* Hoffman, E. (Poole Hosp., Middlesbrough, England). *Thorax* 23(5):541-549, 1968.

327 **CONGENITAL TRACHEOESOPHAGEAL FISTULA WITHOUT ESOPHAGEAL ATRESIA.** *(E.)* Riggs, W. Jr. (U. Tennessee Coll. Med., Memphis). *Southern Med J* 62(2):135-140, 1969.

328 **ESOPHAGEAL RESECTION: GASTROESOPHAGEAL ANASTOMOSIS.** *(E.)* Peterson, T. A. (Minneapolis, Minn.), F. E. Johnson and J. C. Kiser. *Minn Med* 51(10):1351-1354, 1968.

329 **LYE STRICTURE OF THE OESOPHAGUS IN AN INFANT.** *(E.)* Thompson, D. T. (Cent. Hosp., Salisbury, Rhodesia). *J Roy Coll Surg Edinb* 13(6): 330-332, 1968.

330 **THE PLACE OF POSTERIOR GASTROPEXY IN THE TREATMENT OF HIATUS HERNIA IN ADULTS (FIVE PERSONAL CASES).** *(Fr.)* Parneix, M. *Bordeaux Chir* 2(3):179-186, 1968.

331 **EXPERIMENTAL AND CLINICAL EVALUATION OF AN EVERTING ESOPHAGEAL ANASTOMOSIS IN THE GROWING SUBJECT.** *(E.)* Wesselhoeft, C. W. (George Washington U. Sch. Med., Wash-

ington, D.C.), D. H. Glew, J. G. Randolph and B. Blades. *J Thorac Cardiovasc Surg* 56(5):658-666, 1968.

332 OESOPHAGEAL OBSTRUCTION BY MANGO SEED. *(E.)* Agarwal, S. L. (M. L. N. Med. Coll., Allahabad, India). *Indian Pract* 21(9):593-595, 1968.

333 ANASTOMOTIC TECHNIC IN ESOPHAGEAL ATRESIA. *(E.)* Cloud, D. T. (Child. Mem. Hosp., Chicago, Ill.). *J Pediat Surg* 3(5):561-564, 1968.

34 POST-VAGOTOMY DYSPHAGIA. *(Sp.)* Curto Cardus, J. (Soc. Security Med. Ctr., Barcelona, Spain), D. Gomez Sanchez and C. Crespo Cortejoso. *Rev Esp Enferm Apar Dig* 27(8):1207-1216, 1968.

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36 THE TREATMENT OF ESOPHAGEAL BURNS AND CICATRICIAL STENOSIS. *(Fr.)* allemant, Y. *Cah Coll Med Hop Paris* 9(12):1043-1054, 968.

37 PERSONAL EXPERIENCE IN THE TREATMENT OF CARDIOSPASM. *(Bul.)* Krustinov, G. Higher Med. Inst., Varna, Bulgaria), G. Chepilev and S. Belov. *hirurgiia (Sofiia)* 21(5):417-421, 1968.

38 PLANTS ASSOCIATED WITH ESOPHAGEAL CANCER CASES IN CURACAO. *(E.)* Morton, F. (U. Miami, Coral Gables, Fla.). *Cancer Res* 28(11):2268-71, 1968.

39 THE STORY OF ESOPHAGEAL ATRESIA AND TRACHEOESOPHAGEAL FISTULA. *(E.)* shcraft, K. W. (U. Kansas Sch. Med., Kansas City) and M. Holder. *Surgery* 65(2):332-340, 1969.

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1 ACHALASIA CARDIAE. *(E.)* Tala, P. (U. Cent. Hosp., Helsinki, Finland), R. Luosto and Maamies. *Ann Chir Gynaec Fenn* 57(3):281-286, 1968.

2 SPONTANEOUS RUPTURE OF ESOPHAGUS: ONE TRANSVERSE RUPTURE. *(E.)* Bangash, (New Jersey Coll. Med., Jersey City), N. J. Demos and Timmes. *New York J Med* 68(13):1857-1860, 1968.

343 CONGENITAL OESOPHAGOBRONCHIAL FISTULA WITH PRESENTATION IN ADULT LIFE. *(E.)* Le Roux, B. T. (U. Natal, South Africa) and M. A. Williams. *Brit J Surg* 55(4):306-308, 1968.

344 NINE-YEAR EXPERIENCE WITH HIATUS HERNIA AT THE HARTFORD HOSPITAL. *(E.)* Giffin, L. A. (Hartford Hosp., Conn.). *Hartford Hosp Bull* 23(4):255-263, 1968.

345 REPLACEMENT OF THE ESOPHAGUS BY A REVERSED GASTRIC TUBE: TECHNIQUE. *(Sp.)* Santangelo, H. (Francisco T. Olivera, Inst. Gastroent. Path. Nutrit., Buenos Aires, Argentina), R. A. Garriz and A. F. Valoni. *Prensa Med Argent* 55(30):1447-1452, 1968.

346 FATAL HEMORRHAGE FROM AN ESOPHAGO-AORTIC FISTULA CAUSED BY A SWALLOWED BONE FRAGMENT. [CASE REPORT] *(E.)* Verhage, J. C. (Zutphen Gen. Hosp., Netherlands). *Arch Chir Neerl* 20(4):301-304, 1968.

347 BLEEDING ESOPHAGEAL VARICES–EXPERIENCES IN A GENERAL HOSPITAL. *(E.)* Reynolds, J. C. (Akron City Hosp., Ohio). *J Kansas Med Soc* 69(11):513-523, 1968.

348 STUDIES ON RECONSTRUCTION OF THE ESOPHAGUS WITH PEDICLED COLONIC SEGMENT. *(E.)* Mashidori, K. (Yamaguchi U. Med. Sch., Japan). *Arch Jap Chir* 37(6):854-866, 1968.

349 STUDIES ON REPLACEMENT FOR THE CERVICAL AND UPPER THORACIC ESOPHAGEAL DEFECTS BY FREE TRANSPLANTATION OF A GASTRIC OR INTESTINAL SEGMENT. *(E.)* Matsui, H. (Kyoto Med. Sch., Japan). *Arch Jap Chir* 37(6):817-834, 1968.

350 ATRESIA OF THE ESOPHAGUS: INCREASED SURVIVAL WITH STAGED PROCEDURES IN THE POOR-RISK INFANT. *(E.)* Hamilton, J. P. (Charlotte Mem. Hosp., N. C.). *Coll Works Cardiopulm Dis* 14(1):44-57, 1968.

351 DIAGNOSIS AND MANAGEMENT OF GLOBUS HYSTERICUS. *(E.)* Young, J. R. Jr. (Natchez, Miss.). *J Mississippi Med Ass* 9(12):576-579, 1968.

352 SOME OBSERVATIONS ON STRANGULATED POST-TRAUMATIC DIAPHRAGMATIC HERNIA. *(It.)* Orecchia, C. (Maggiore Hosp., Vercelli, Italy) and F. Sigaudo. *Minerva Chir* 23(21):1161-1165, 1968.

See also: 229,230,233,247,296,304,377,423

STOMACH

(Gastric ulcer is placed with peptic ulcer)

353 OCCURRENCE OF FETAL SULPHOGLYCOPROTEIN ANTIGEN IN THE GASTRIC JUICE OF PATIENTS WITH GASTRIC DISEASES. *(E.)* Häkkinen, I. (Dept. Med. Microbiol. Path., U. Turku, Finland) and S. Viikari. *Ann Surg* 169(2):277-281, 1969.

Gastric juice collected from 78 patients with proven gastric cancers, 63 with peptic ulcers, 57 with other gastric diseases, and 28 young healthy persons was studied for the presence of a fetal sulfoglycoprotein antigen (FSA). Using a specific rabbit antiserum, FSA was found in 75 of the 78 gastric cancer patients, 9 of the 63 patients with peptic ulcers, 5 of the 57 patients with other gastric diseases, and none of the controls. FSA was still present in 7 of 13 patients reexamined 1-6 months after surgery for gastric cancer. Among 24 5-yr survivors following surgery for gastric cancer, only 4 had FSA. These results indicate that FSA is a regular component of the gastric juice of patients with gastric cancer, and suggest that there may be a relation between FSA and carcinogenesis. The presence of FSA in the gastric juice may be a valuable diagnostic sign of an existing or future cancer.

354 GASTRIC CANCER: THE SUCCESS OF EARLY DETECTION BY A COORDINATED PROGRAM OF PERIODIC GASTRIC MUCOSAL X-RAY STUDIES AND GASTROSCOPIC AND GASTRIC CAMERA OBSERVATIONS. *(E.)* Nakayama, K. (Tokyo, Japan). *Surgery* 65(2):227-231, 1969.

A proposal for a systematic screening program to detect early cancer of the stomach is supported by the author's experience with 559 asymptomatic patients who were examined by gastrointestinal X-ray twice a year since March 1965; many also were examined by gastric camera and gastroscopy. Fifteen cases of early gastric cancer were discovered and verified by operation. All survived surgery and are living normally. A typical case report is presented. The significance of early detection is emphasized by a 5-yr follow-up study of 363 cases subjected to gastrectomy for carcinoma (1946-1952); 47% survived more than 5 yr after radical resection, compared to only 7% after palliative resection. Follow-up analysis of 252 cases after gastrectomy also indicated survival beyond 5 yr in more than 80% of patients when the original tumor size was less than 2 cm; up to 4 cm the survival rate was 26.9%, at 8 cm or greater it was 22%. When tumor infiltration was restricted to the mucosal layer, 100% lived 5 yr or more; infiltration into the submucosal, muscular or serosal layers reduced the 5-yr survival to 75%, 52% and 17.7%, resp. The author concludes that the extent of infiltration is the most important determinant of the fate of gastric cancer patients.

355 GLOMUS TUMORS OF THE STOMACH. *(E.)* Appelman, H. D. (Armed Forces Inst. Path., Washington, D. C.) and E. B. Helwig. *Cancer* 23(1):203-213, 1969.

The clinical and histological features of gastric glomus tumors are presented on the basis of 12 cases (mean age in the 6th decade, 7 males and 5 females). Upper gastrointestinal bleeding and peptic ulcer symptoms (epigastric pain, nausea, vomiting, anorexia) were the most common complaints. Radiographic signs were not characteristic: interpretations included ulcers, carcinoma, polyps, and extramucosal or intraluminal filling defects. Most of the tumors were located in the distal stomach with equal distribution on both the anterior and posterior walls and both curvatures. Tumors measured 1.0-4.0 cm in diameter and varied in consistency from firm to soft. Mucosal ulceration overlying the tumor was present in 4 cases. All of the tumors were situated within the muscularis propria, with some bulging into the submucosa. The tumors were surrounded by hypertrophic smooth muscle forming a pseudocapsule, and consisted of benign, maturely organized proliferations of glomus cells, blood vessels, and occasional nerve bundles. The histogenesis of the tumor is uncertain. Local resection is adequate therapy. The pathologist's awareness of the gastric glomus tumor can prevent an unnecessary extensive surgical procedure.

356 A STUDY OF SEROTONIN METABOLISM IN THE DUMPING SYNDROME. *(Rus.)* Sveshnikov, A. I. (N. V. Sklifosovskii Sci.-Res. Inst. Emergency Med. Treatment, Moscow, USSR) and L. D. Stoilov. *Sovet Med* 31(10):24-28, 1968.

Blood serotonin and urinary 5-hydroxyindoleacetic acid were determined in 25 normal subjects and in 33 patients (20 men and 13 women, aged 29-75 yr) who had undergone gastrectomies for peptic ulcers. Finsterer's modification of the Billroth II procedure had been performed on 29 and the Billroth I procedure on 4. Dumping syndrome was present in mild to severe forms in 24 of the 33 patients. Patients with dumping syndrome and some controls were tested both while fasting and 15-20 min after ingestion of 150 mg of 50% glucose. Before glucose there was no appreciable difference between patients with dumping syndrome and controls in blood serotonin and urinary 5-hydroxyindoleacetic acid. After glucose ingestion the serotonin blood levels increased significantly in patients with moderate to severe dumping syndrome but remained the same in normal subjects and gastrectomized patients without dumping syndrome. No statistically significant changes occurred in the 24-hr urinary excretion of 5-hydroxyindoleacetic acid in any group. These findings suggest that increased secretion of serotonin by the chromaffin cells of the gastrointestinal tract after ingestion of glucose may be a factor in the production of dumping syndrome.

357 GASTRIC AUTOIMMUNITY IN PERNICIOUS ANEMIA. *(E.)* Goldberg, L. S. (U. California Sch. Med., San Francisco), J. Shuster and H. H. Fudenberg. *J Lab Clin Med* 73(2):249-257, 1969.

Saliva and serum from a patient with pernicious anemia and a secretory IgA autoantibody to intrinsic factor in the gastric juice were studied to determine whether the secretory IgA autoantibody was of salivary origin and whether the IgA component of the gastric antibody was selectively transported from serum into gastric juice. The serum contained both blocking and binding autoantibodies to intrinsic factor restricted to the IgA class of immunoglobulins; the serum binding antibody had both kappa and lambda light chains. Antibody activity was not detected in the patient's saliva. The immunologic differences between the secretory IgA autoantibody in gastric juice and the

;A autoantibody in serum indicate that they are products of
ifferent immune systems. These data suggest that the secretory
;A autoantibody to intrinsic factor was produced by immun-
logically competent cells of the gastric immune system, thus
stablishing the concept of gastric autoimmunity in pernicious
nemia.

58 **GASTRIC XANTHELASMA.** *(E.)* Kimura, K.
(Dept. Path., Atomic Bomb Casualty Comm.,
ijiyma Park, Hiroshima, Japan), T. Hiramoto and C. R.
uncher. *Arch Path* 87(1):110-117, 1969.

ne or more gastric xanthelasmas were noted in 113 (58%)
f 193 consecutive autopsies performed at Hiroshima during
)64-1965. Only 1 lesion was present in 35 cases (31%), 2
23 (20%), and 3 in 16 (14%). In 2 cases there were more
an 10 lesions present. Sixty-three percent of the xanthelasmas
ere in the fundic portion of the stomach. Most of the lesions
ere 1-2 mm in diameter, rounded or oval, circumscribed,
llow or yellow-white, and macular or nodular. Histologically,
e lesions consisted of collections of foam cells in the lamina
opria. The presence of xanthelasmas was unrelated to the
rum cholesterol level. The lesion increased in frequency with
e, was more common among men than women, and was often
sociated with intestinal metaplasia of the gastric mucosa.
nere was no relation between gastric xanthelasma and expo-
re to the atomic bomb. It is suggested that xanthelasmas may
a sequel to old focal ulceration.

59 **PROLAPSE OF THE GASTRODUODENAL MUCOSA: A CLINICAL STUDY.** *(It.)* Jori,
P. (Inst. Spec. Med. Path., U. Naples, Italy), G. Mazzacca
d M. Mansi. *Riforma Med* 82(42):1153-1160, 1968.

ne mucosa of the gastric antrum protruded through the py-
rus into the duodenal bulb in 230 (6%) of 3812 patients
bjected to X-ray studies between 1955 and 1967. These in-
ided 168 men and 62 women, aged 18-76 yr. Other organic
ions of the stomach and/or duodenum were found in 98 of
ese patients (61 men and 37 women), but only 3 had chole-
hiasis. The lesions included gastroduodenitis in 58 cases, duo-
nal ulcers in 14, stomach ulcers in 11, duodenal diverticulosis
6, hiatus hernia in 6, and benign neoplasms of the stomach
d/or intestine in 3. The most common complaint was inter-
ttent epigastric pain which was sometimes accompanied by
lching, nausea, and vomiting after meals. Only 2 patients
er showed any signs of gastrointestinal bleeding. When placed
an ulcer diet, 71 of the 128 patients with no other lesions
owed definite subjective improvement, as did 6 of 9 patients
o were given metoclopramide tablets t.i.d. before meals.
rgery is concluded to be the only effective treatment in severe
es.

) **THE VALUE OF THE B II-B I CONVERSION IN THE TREATMENT OF THE POSTGASTREC-
MY SYNDROME.** *(E.)* Borg, I. (Dept. Surg., U. Lund, Malmö,
eden), S. G. Borgström and K. Haeger. *Acta Chir Scand*
4(8):655-659, 1968.

29 patients (14 men and 15 women, 27-60 yr old) who had
1 Billroth II gastric resections for various reasons (gastric
er, duodenal ulcer, perforation, pain or hemorrhage) and
1 been followed for 1-14 yr (average 5.5), conversion to a
lroth I anastomosis was performed because of dumping
symptoms in 16, severe anemia in 2, severe weight loss in 1, afferent loop syndrome in 5, stenosis of the loop in 1, pain after meals in 2, and recurrent jejunal ulcers in 2 patients. The patients were followed for 1-12 yr (average 7.2) after the conversion and the clinical results were evaluated. None of the 16 patients with dumping as the main reason for conversion were cured; improvement was noted in 6, no change in 8, and marked deterioration in 2. Two cases with no dumping symptoms before the conversion had moderate dumping afterward. No significant effect on anemia or weight loss was noted. Of the 5 patients with the afferent loop syndrome, conversion resulted in total recovery in 1 and marked improvement in 3. Of the 2 patients with recurrent jejunal ulcers, the ulcer diathesis was cured; however, 1 developed mild dumping symptoms and 1 developed a small stomach syndrome. Psychiatric symptoms were noted in 2/3 of the patients; 20 had consulted a psychiatrist and 8 of them had been treated in a psychiatric ward. It is concluded that conversion of a Billroth II to a Billroth I resection, for the relief of dumping, should be avoided.

361 **COMPARATIVE EVALUATION OF THE MOTOR ACTIVITY OF THE GASTRIC STUMP AND SMALL INTESTINE AFTER RECONSTRUCTIVE GASTRODUODENOJEJUNOPLASTY.** *(Rus.)* Gerasimets, M. T. *Eksp Khir Anest* 13(5):22-23, 1968.

In dogs, gastric resection by the technique of Hofmeister and Finsterer produced continuous contractions in the gastric stump. These contractions were intensified by conditioned and unconditioned food stimuli. The motility of the gastric stump decreased after gastroduodenojejunoplasty, in which a section of the jejunum was transplanted between the gastric stump and the duodenum, and periods of active contractions alternated with periods of relative rest. It took 20-30 min for the stomach to empty fluids and 60-80 min for it to empty bread and meat. Gastric resection produced a marked decrease in the rhythm of duodenal peristalsis, but the rhythm of pendular contractions remained the same. Food stimuli inhibited duodenal motility for the entire time the food stayed in the stomach. Emptying of food into the duodenum was accompanied by cessation of motor activity in the gastric stump and a marked increase in motor activity of the duodenum and inlet loop. No change occurred in the motility of the outlet loop after gastric resection; this activity was similar to that of the pylorus and was retained after reconstructive surgery. The increased ileal motility occurring after reconstructive surgery gradually decreased and reached normal values 4 months after surgery.

362 **PATHOPHYSIOLOGIC MECHANISMS OF SHOCK IN ACUTE GASTRIC DILATATION.** *(E.)* Passi, R. B. (Ohio State U. Coll. Med., Columbus), A. R. Kraft and J. S. Vasko. *Surgery* 65(2):298-303, 1969.

In an effort to clarify the pathophysiology of shock in acute gastric dilatation, the hemodynamic responses to acute, experimentally-induced, gastric dilatation were measured in 18 dogs. As intragastric pressure increased, inferior and superior vena cava blood flow decreased, and no flow was recorded in the inferior vena cava of 9 animals. Concomitantly, the average superior and inferior vena cava pressure increased and the mean systemic arterial pressure decreased. Following rapid gastric decompression, most of the pressures returned to control levels, although the mean systemic arterial pressure returned to basal levels in only 4 dogs. Gastric decompression was accompanied by an immediate increase in vena caval blood flow. These findings indicate that shock secondary to acute gastric dilatation is produced by functional inferior vena cava obstruction with an associated decrease in venous return to the heart. Pretreatment of 9 dogs with 500-1000 ml of Ringer lactate i.v. did not prevent shock, but 12 dogs (including 6 who were pretreated with fluids) required fluid after gastric decompression to restore the mean arterial pressure to control levels. Bilateral thoracic sympathectomy (2 dogs) and bilateral cervical vagotomy prior to gastric dilatation (1) did not influence the hemodynamic responses.

363 **CHOLELITHIASIS AS A COMPLICATION OF STOMACH SURGERY.** *(Ger.)* Pfeiffer, K. M. (Surg. Clin., U. Basel, Switzerland) and J. H. Dunant. *Schweiz Med Wschr* 98(50):1975-1978, 1968.

During a 5-yr period, 50 patients (40 males and 10 females) had biliary tract surgery 1-30 yr after stomach surgery. Of the stomach operations, 47 had been for peptic ulcers; 28 of these operations were Billroth II gastrectomies and only 2 were Billroth I. Gallstones were found in 49 of these 50 patients. Since no evidence was found that cholelithiasis occurs more frequently among peptic ulcer patients than among the general population, stomach surgery itself is considered to have been the cause of cholelithiasis in these patients. Changes produced by stomach surgery which might contribute to the development of cholelithiasis include: 1) bacteria in the duodenum and upper jejunum which might ascend in the biliary tract, producing local inflammation and stones, 2) disturbances in flow from the extrahepatic biliary tract due to scar formation near the duodenum, 3) production of cholestasis in the afferent loop because of the overproduction of cholecystokinin or a spillover of similar substances in the general circulation, or 4) enlargement of the gallbladder and a decrease in its tonus due to denervation in vagotomized patients.

364 **COMPARATIVE DATA ON THE ACTIVITY OF PROTEOLYTIC ENZYMES IN THE STOMACH IN VARIOUS STOMACH DISEASES, INCLUDING CANCER.** *(Rus.)* Iansone, I. L. *Klin Lech Zlok Novoobr* 11:15-17, 1968.

The activity of proteolytic enzymes in the gastric juice was studied at pH 1.5-2.0, 3.5, and 4.0-5.0 in 105 subjects after parenteral administration of histamine. These subjects included 25 with stomach cancer, 52 with chronic histamine-resistant anacidic gastritis, and 28 normal controls. In controls, proteolytic enzyme activity was high at all pH's, but particularly at pH 1.5-2.0. In patients with chronic anacidic gastritis stomach secretion was delayed and lasted 45 min at most. The activity of proteolytic enzymes was low, reaching maximum values at a pH of 4.0-5.0. Proteolytic enzyme activity was low only at a pH of 1.5-2.0 in patients with achlorhydria and stomach cancer. These findings indicate that the chief and parietal cells function normally in stomach cancer, but that there is a change in the reaction of the chief cells to histamine stimulation.

365 **PARIETAL CELL AND INTRINSIC-FACTOR ANTIBODIES IN INDIAN SUBJECTS.** *(E.)* Desai, H. G. (Tata Mem. Hosp., Bombay, India), P. K. Dighe and A. V. Borkar. *Scand J Gastroent* 3(3):321-326, 1968.

The incidence of circulating parietal cell (PCA) and intrinsic factor antibodies (IFA) in 285 control subjects, patients with iron deficiency anemia (145), chronic gastritis (22), pernicious anemia (13), thyrotoxicosis (50), or diabetes mellitus (150), other hospitalized patients (185), and relatives of patients (50) in India were compared with results reported from Britain, North America, and Australia. Among the controls, the incidence of PCA (7.3%) was similar to that seen in western populations (3-8%); among the various patient groups, the incidence of PCA (14-62%) was greater than that seen in controls, but also similar to that seen in western populations. However, among all 900 Indians studied, IFA was found in only 1 patients from India supports the concept that the 2 antigen-antibody systems of the gastric mucosa are independent of each other.

366 **AN IMMUNOLOGICAL AND HISTOIMMUNOLOGICAL STUDY OF GASTRIC SULPHOGLYCOPROTEINS IN HEALTHY AND ASPIRIN-TREATED DOGS.** *(E.)* Hakkinen, I. P. T. (Dept. Med. Microbiol., U. Turku, Finland) R. Johansson and M. Pantio. *Gut* 9(6):712-716, 1968.

Immunological and histoimmunological techniques were used to identify and localize the sulfoglycoproteins in the gastric mucosa of 12 adult mongrel dogs and to study the possible effect of aspirin on gastric mucus secretion. Aspirin tablets were fed orally to 8 dogs at 70-140 mg/kg body weight daily for 3.5 months, while the remaining 4 dogs served as controls. As a result, 6 of the 8 dogs in the aspirin group developed small multiple erosions and bleeding in the gastric mucosa. Double immunodiffusion studies showed that one of the 2 sulfoglycoprotein components in the gastric juice of the control group was absent from the gastric juice of the aspirin group. The aspirin group showed increased electrophoretic polydispersion and the intensity of the specific fluorescence in the mucosa of all control dogs was higher than that seen in the aspirin dogs. Prolonged feeding of aspirin thus had a selective inhibitory effect on the secretion and presumably on the synthesis of a gastric sulfoglycoprotein in the dog. The results indicate that the sulfoglycoprotein component specific to the superficial mucous cells is mainly affected. This may be analogou to the human gastric sulfoglycoprotein which is also synthesized by the superficial gastric mucous cells. There was little or no effect on the sulfoglycoprotein derived from the deep pyloric-type glands in the gastric antrum and from the mucous neck cell area in the corpus and cardia.

367 **PATHOLOGICAL AND HISTOLOGICAL CHANGES IN THE LYMPHATIC SYSTEM OF THE STOMACH DURING MALIGNANT DEGENERATION OF GASTRIC ULCERS.** *(Rus.)* Kalinka, V. D. *Klin Lech Zlok Novoobr* 11:49-54, 1968.

The lymphatic system was studied in 40 stomach specimens from patients with gastric ulcers and cancer by injecting contrast media and staining with lymphotropic agents. In specimens from patien with chronic ulcers, smooth muscle proliferation was found in the walls of the lymph vessels, particularly in the serous and fatty tissues of the greater and lesser curvatures. Destructive and proliferative changes in lymph vessels in granulation tissue uderlying such ulcers resulted in acellular gastrosclerosis. Disturbances in lymph circulation and the vasa vasorum contributed to the development of arteritis and phlebitis. In the early stages of malignancy, atypical endothelial growth was characterized by hyper- and hypochromatosis, polymorphism, anaplasia, proliferation, and hyperplasia. The formation of neoplastic lymph follicles and lymph nodes occurred simultaneously. As the process advanced, endarteritis and phlebitis produced obliterative changes in some the blood vessels and resulted in the formation of arteriovenous astomoses. To compensate for circulatory disorders, anastom- es also developed between blood and lymph vessels, through iich cancers could metastasize to the liver and other organs. It suggested that the disturbances in lymph circulation found in stritis, chronic ulcers, and stomach cancer are probably related the activity of gastrointestinal hormones controlling stomach cretion.

8 FUNCTIONAL AND GENERAL COMPLICATIONS OF GASTRECTOMY. PART 2: CASES.

.) Le Bodic, L. (Med. Clin. B, Nantes, France), G. Baudry l J. Visset. *J Med Nantes* 8(3):153-166, 1968.

tailed case reports are presented for 6 patients who developed mplications after Polya or Finsterer gastrectomies for peptic ers or gastric neoplasms. All 6 had gastrojejunal anastomoses. o patients had dumping syndrome; 2, afferent loop syndrome; episodes of severe hyperglycemia; and 1, malabsorption with rrhea and mild steatorrhea. In all cases, gastroduodenal con- uity was successfully reestablished by the procedure of apault, Henley, and Bucaille, with resultant elimination of nptoms.

EXPERIMENTAL STUDY OF THE VASCULARIZATION OF THE STOMACH BY ARTERIO- LEBOROENTGENOGRAPHY IN PEPTIC ULCER AND OMACH CANCER.

(Rus.) Kalinka, V. D. *Klin Lech Zlok voobr* 11:43-48, 1968.

od vessels were filled with contrast medium and photographed, histological studies were made of biopsy and autopsy material n 50 patients with gastritis, chronic ulcers, and stomach can- In chronic ulcers, veins accompanied arteries and blood els often radiated from the center of the ulcer, while in acute rs veins did not accompany arteries and the blood vessels, narily veins, formed interrupted, looped, nodular, or varicose res. In chronic ulcers, blood vessels showed diffuse or local- defects in filling which were surrounded by systems of sinus- and arteriovenous anastomoses. These networks were not narily found around perforated ulcers. The interrupted figures ned by arteries and veins in chronic ulcers might account for ular erosion and thrombosis and the development of arteritis phlebitis. In stomach cancer, the vascular network of the or was formed of small, interrupted, blurred, and sometimes sible vessels which were sinusoidal in nature. Both in the or itself and in other parts of the stomach no differences e seen between arteries and veins, indicating that they had ned anastomoses.

SIGNS OF ATYPISM IN STOMACH CANCER CELLS ACCORDING TO THE RESULTS OF OLIATIVE CYTOLOGY.

(Rus.) Bramberga, V. M. *Klin Zlok Novoobr* 11:37-42, 1968.

from stomach washings obtained from 104 patients (51 s and 53 females, aged 29-81 yr) with histologically diag- d stomach cancer were examined for signs of cellular atypism. e adequate material could not be obtained for cytological ies, 4 patients were excluded. Cancer cells were found in ings from 87 of the remaining 100 patients, and cells sus- ed of being cancerous were found in 9. A list of 27 signs of ism is presented. Eleven signs found in more than 60% of ases were: irregular arrangement of cancer cells, increased cell size, changes in shape, anisocytosis or anisokaryosis, increase in the size of the nucleus, "bare" nuclei, lumpy chromatin structure, nuclear hyperchromatism, basophilic cytoplasm, polychromasia, and cytoplasmic vacuoles and inclusion bodies. A statistical analysis of these results showed that 5 signs were found significantly more frequently in adenocarcinoma than in other histological forms of stomach cancer. These included a patterned arrangement of the cancer cells, vacuolization of the nucleus, karyolysis, an increased number of nucleoli, and cytoplasmic vacuoles and inclusion bodies. There was no relation between the frequency with which a sign was seen and the stage of the cancer or its site in the stomach.

371 MORPHOLOGICAL CHANGES IN THE GASTRIC MUCOSA IN PATIENTS WITH CHRONIC ENTEROCOLITIS (FROM THE RESULTS OF ASPIRATION BIOPSIES).

(Rus.) Shapiro, F. M. (Inst. Nutrit., Acad. Med. Sci. USSR, Moscow) and N. B. Shalygina. *Arkh Pat* 30(10):69-74, 1968.

Histological and histochemical studies were made of gastric mucosa obtained by aspiration biopsy from 41 patients with enterocolitis confirmed by biopsies of the small and large intestines. Material was removed from the gastric fundus or greater curvature with a modified Budd tube. The gastric mucosa was normal in 12 cases. In 29 cases atrophy of the chief cells was accompanied by lymphoid and plasma cell infiltration. In severer forms of atrophy there were accumulations of argyrophilic fibers in the mucosa and a decrease in the intensity with which collagen fibers in the stroma were stained. The number of elastic and reticular fibers in the muscularis mucosae was increased, and bundles of them passed into the mucosal stroma; the collagen fibers were resorbed. No clear-cut relation could be established between the morphological condition of the gastric mucosa and the duration or clinical severity of the disease. In 34 cases the disease was apparently produced primarily by lesions in the mucosa of the small and large intestine and in 7 cases by lesions in the gastric mucosa.

372 HEMOLYMPHANGIOMA OF THE STOMACH.

(Gr.) Tsirakoglou, D. (People's Hosp., Salonika, Greece) and F. Efraimidis. *Galenos* 10(7/8):354-356, 1968.

373 GASTRITIS.

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STOMACH

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SMALL INTESTINE

29 **VOLVULUS OF THE SMALL INTESTINE IN
ADULTS: A STUDY OF PREDISPOSING
ACTORS.** *(E.)* Vaez-Zadeh, K. (Pahlavi U. Med. Sch., Shiraz,
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hirty-three cases (32 males, and 1 female) of primary small
owel volvulus (volvulus without obvious anatomical cause)
ıd 8 cases (5 males and 3 females) of secondary small bowel
lvulus (rotation caused by abnormal fixation due to acquired
congenital lesions) were seen at the Saadi Hospital in Shiraz
ıring a 5-yr period, accounting for 19.6% of all intestinal
ostructions; another 16.7%, 14.8% and 41.6% were accounted
r by large bowel volvulus, adhesions, and strangulated hernia,
sp. Important features in this series included 1) the absence
obese patients, 2) 39 of the 41 patients had strong abdom-
al muscles, 3) all were farmers and most were middle-aged,
12 cases were seen during June and July when prolonged
ysical exertion was most common, 5) women were infre-
ently involved, and 6) the diet consisted largely of high-
sidue foods eaten twice a day. Abdominal trauma, pregnancy,
rgation, and habitual constipation were not predisposing fac-
rs, and no foreign bodies, gallstones, or mesenteric cysts were
ınd. Measurements taken at operation in 6 patients revealed
onger mesentery than that found in the general population
ıtopsy series of 100 unselected cases). The causes of the
ondary volvulus in 8 patients were postoperative adhesions
, Meckel's diverticulum (1) and appendicitis (1). It is con-
ded that primary volvulus of the small intestine is initiated
bulky, poorly digestible meals taken at long intervals, and
avored by hypermotility of the gut and hypermobility of
mesentery.

) **JEJUNAL DIVERTICULA.** *(E.)* McClure, J. N. Jr.
(Emory U. Sch. Med., Atlanta, Ga.) and G. M.
ırdasis. *Southern Med J* 61(12):1369-1373, 1968.

etiology, clinical characteristics and complications of jejunal
erticula are discussed on the basis of 18 patients (9 males, 9
ıales) treated during a 10-yr period. Only 1 patient was less
n 40 yr old and only 5 were less than 50. The symptoms
e classified as acute or chronic, and consisted mainly of
ominal pain (more frequently in the epigastrium or left upper
drant), nausea or vomiting, fever, and bleeding from the
rointestinal tract by mouth or anus. A correct preoperative
nosis was made in only 4 patients having acute diverticulitis
ı perforation. Complications such as acute inflammation,
oration, bowel obstruction and hemorrhage necessitated
ical intervention in 6 patients, consisting of a bowel resec-
with an end-to-end anastomosis. There was no mortality
minimal morbidity in this series. The 12 patients who were
acutely ill did relatively well on conservative treatment con-
ng of a low-residue diet, frequent small meals, a supine posi-
after meals, and antispasmodics.

**FUNCTIONAL AND MORPHOLOGICAL
CHANGES IN THE JEJUNUM IN PATIENTS
H THE DUMPING SYNDROME.** *(Rus.)* Aruin, A. I.
M. Sechenov 1st Moscow Med. Inst., USSR), M. A.
ogradova, M. N. Vlasova, P. I. Korzhukova and M. A.
stova. *Klin Med (Moskva)* 46(10):116-124, 1968.

Determinations of the enterokinase and alkaline phosphatase levels in the small intestinal secretions and feces and studies of the absorption of ^{131}I-labeled triolein and oleic acid revealed functional jejunal disorders in 32 of 57 patients with post-gastrectomy dumping syndromes. These patients were 26-52 yr old and had been operated on for peptic ulcers from 2.5 months to 15 yr before; 12 patients also had an ascending loop syndrome and 32 had enterocolitis of varying degrees of severity. Although there was no relation between the severity of the functional disorders and that of the dumping syndrome, there was a significant increase in enterokinase and alkaline phosphatase secretion in mild-moderate enterocolitis. Histological, histochemical and histoenzymological studies of jejunal mucosal specimens obtained by aspiration biopsy (25 cases) or at surgery (32 cases) revealed a normal mucosa in 28 patients and varying degrees of jejunitis in 29. The jejunitis was most severe, reaching the stage of atrophic jejunitis, near the anastomosis and decreased in severity aborally. There was again no correlation, however, between the severity of the jejunitis and that of the dumping syndrome.

432 **SMALL INTESTINAL ULCERS AND INTESTINAL FLORA IN RATS GIVEN INDOMETHACIN.** *(E.)* Kent, T. H. (Dept. Pathology, U. Iowa, Iowa City), R. M. Cardelli and F. W. Stamler. *Amer J Path* 54(2):237-249, 1969.

Intragastric or intramuscular administration of indomethacin in single doses produced penetrating longitudinal ulcers on the mesenteric side of the distal jejunum and ileum of rats; ulcers in the stomach, duodenum and colon were focal and less frequent. Doses of 5 and 10 mg/kg resulted in mild, nonfatal ulcers, while 20, 30 and 40 mg/kg produced multiple, severe ulcerations (average 4 mm wide, up to several mm long) with variable penetration and areas of perforation into the mesentery resulting in fatal peritonitis and bacteremia. The ulcers appeared 12-18 hr after administration of the drug and reached a maximum size in 3-4 days. Two days after the administration of 30 mg/kg indomethacin, there was a significant increase in the numbers of *E. coli*, *Bacteroides* and *Clostridium* in the mid small intestine. Oral administration of neomycin, polymyxin B and bacitracin for 14 days beginning 2 hr after administration of 30 mg/kg indomethacin was effective in reducing the severity and lethality of the ulcers and prevented bacterial overgrowth and bacteremia. With intragastric antibiotics 2 or 3 times daily for 12 or 14 days, there was some protective effect but generalized peritonitis sometimes still developed. In one experiment, combined oral and intragastric administration of these antibiotics achieved 100% protection against the lethal effects of 30 mg/kg of indomethacin, but at 40 mg/kg protection was only partial. It appears that the bacterial flora plays a role in the genesis of indomethacin-induced ulcers. Antibiotics may reduce the severity of the ulcerations by permitting healing to begin sooner, rather than by preventing some synergistic effect between the bacterial flora and indomethacin in producing the initial lesion.

433 **ENHANCEMENT OF X-RAY EFFECTS ON THE SMALL INTESTINAL EPITHELIUM OF DOGS BY ACTINOMYCIN D.** *(E.)* Concannon, J. P. (Allegheny Gen. Hosp., Pittsburgh, Pa.), R. E. Summers, J. King, G.

Tcherkow, C. Cole and E. Rogow. *Amer J Roentgen* 105(1): 126-136, 1969.

The effects of actinomycin D alone (50-100 μg/kg), whole-body and upper abdominal X-irradiation alone (1100-3100 r), and actinomycin D plus irradiation on the small intestinal epithelium were investigated in 33 male beagles. The combination of antibiotic and irradiation caused death in 9 of 12 animals exposed to doses of irradiation usually producing no significant clinical, histological, or biochemical abnormalities; death was caused by severe changes in the small intestinal epithelium following treatment. There was a marked depression in serum chloride in 50% of the animals given the combination treatment. Serum phosphorus elevation was related to administration of actinomycin D rather than to the combined treatment; bone marrow and lymphocyte depression also appeared to be related to the drug. It is possible that actinomycin D reduces the number of viable crypt cells or sublethally damages these cells. The effects of ionizing radiation on the reduced number of viable cells or on cells sublethally damaged by actinomycin D could be an important factor in the production of increased damage. The appearance of moderate to severe gastrointestinal symptoms in patients with intraabdominal neoplasms receiving combined treatment should indicate immediate cessation of therapy.

434 **CHANGES IN CHOLESTEROL POOL SIZE, TURNOVER RATE, AND FECAL BILE ACID AND STEROL EXCRETION AFTER PARTIAL ILEAL BYPASS IN HYPERCHOLESTEREMIC PATIENTS.** *(E.)* Moore, R. B. (U. Minnesota Med. Sch., Minneapolis), I. D. Frantz Jr. and H. Buchwald. *Surgery* 65(1):98-108, 1969.

The effect of partial ileal bypass on the daily cholesterol turnover rate in 7 hypercholesteremic patients was evaluated by (1) mathematically evaluating the serum cholesterol specific activity-time decay curve following a single i.v. injection of cholesterol-4-^{14}C, and (2) measuring the fecal bile acid and neutral sterol excretion. The exchangeable cholesterol pool size was also measured by an isotopic method. The 7 patients had been on a "cholesterol-lowering" diet for at least 3 months prior to the operation. The bypass procedure was performed 60 days after a single i.v. injection of 30 μC labeled cholesterol. Using a two-compartment open mamillary system as a model to describe the behavior of the labeled cholesterol, a distinct increase in the negative slope of the serum cholesterol specific activity curve was observed for 2 months after ileal bypass, and the linear portion of the curve showed a steeper slope than before the operation (half-time value of 24 days compared to 65 days). This is indicative of a marked increase in the cholesterol turnover rate following surgery. A 3-fold increase in cholesterol turnover rate was found in 3 subjects similarly studied one year after the operation. The calculated size of the total exchangeable cholesterol pool in these 3 subjects was greater than in normal subjects before the operation and the average size of the freely miscible pool was also greater than that observed in normals, suggesting that the hypercholesteremic patients had greater amounts of exchangeable cholesterol in their bodies and that there was a net loss of body cholesterol one yr after ileal bypass. Fecal sterol measurements in 3 patients indicated a significant increase (2.7-fold) in neutral sterol excretion and a 4.9-fold increase in bile acid excretion after ileal bypass. The reported findings are consistent with the thesis that distal ileal bypass establishes a two-fold drain on the body cholesterol pool: (1) a direct drain produced by increased fecal loss of normally absorbed (exogenous) and reabsorbed (endogenous) cholesterol, and (2) an indirect (metabolic) drain resulting from reduced bile acid absorption, which produces a compensatory increase in hepatic conversion of cholesterol to bile acids.

435 **NONSPECIFIC STENOSING SMALL BOWEL ULCERS: EXPERIENCE IN ONE CALIFORNIA COUNTY.** *(E.)* Wilson, I. H. (San Diego Co. U. Hosp., Calif.), N. V. Cooley and F. J. Luibel. *Amer J Gastroent* 50(6):449-455, 1968.

Thirty-five cases of nonspecific, stenosing, usually ulcerating lesions of the small intestine occurred in San Diego County (population about 1,200,000) in 2 separate "epidemics" during 1963-68, with a "hiatus" following the "Warning Letter" of March 1965 from 2 drug firms which manufacture thiazide-potassium preparations. Among the 35 cases, only 8 patients were known to have received neither potassium nor thiazide, either alone or in combination. Two had thiazide without potassium; one had thiazide with plain KCl, one had thiazide and enteric-coated KCl separately, and 23 had received enteric-coated thiazide-potassium formulations for from 5 days to several years. A variety of other drugs, which cannot automatically be exonerated, were also ingested, including reserpine, thyroid, codein, Gantanol, Aldactone-A, Mercuhydrin, Ismelin, Apresoline, digitalis, and salicylates among others. A high incidence of cardiovascular diseases was associated with the lesions. The commonest presenting symptoms were recurring abdominal pain, distention and nausea due to partial intestinal obstruction. Upper gastrointestinal X-rays were the most definitive diagnostic method. Operative findings usually included a short area of stenosis (usually of the ileum), with local inflammatory reaction and dilatation of the proximal bowel. Three illustrative case reports are presented.

436 **THE METABOLISM OF CHOLESTEROL AFTER RESECTION OR BY-PASS OF THE LOWER SMALL INTESTINE.** *(E.)* Moutafis, C. D. (Hammersmith Hosp., London, England), N. B. Myant and S. Tabaqchali. *Clin Sci* 35(3):537-545, 1968.

In two men (54 and 77 yr old) with previous ileal resections and one girl (10 yr old) with an ileal by-pass, the half-life of plasma ^{14}C cholesterol (33, 30 and 29 days, resp.) was markedl shorter than the average value for normal subjects (50-69 days); in the child, the preoperative half-life had been 45 days. Increased cholesterol turnover is expected in such patients since the absorption of exogenous cholesterol, and hence the reabsorption of cholesterol excreted in the bile, are decreased in the absence of a functioning ileum. The rate of excretion of the exchangeable cholesterol as bile acids and neutral steroids in the feces was investigated by the 'isotopic balance' method in both patients with ileal resections. In both men, the fecal excretion of total steroids was 2-3 times higher than normal; the increase in excretion of neutral steroids was slight, while the bile acid output was markedly elevated, yielding an abnormally high ratio for bile acids/total steroids in the feces. These findings indicate that removal or by-pass of the ileum leads to increased endogenous synthesis of cholesterol, and are consistent with the existence in man of a feed-back inhibition of cholesterol synthesis, as has been clearly demonstrated in animals.

37 **A DOUBLE-TUBE TECHNIC FOR THE TREATMENT OF MECONIUM ILEUS AND SMALL
OWEL ATRESIA.** *(E.)* Rehbein, F. (Child. Surg. Clin.,
remen, Germany) and H. Halsband. *J Pediat Surg* 3(6):723-
26, 1968.

order to utilize the principles of decompression and splinting
the small bowel in 14 neonates with meconium ileus (5),
nall bowel atresia (8), or both (1), a double-tube system con-
sting of a thick and thin plastic tube joined together for a
ngth of 3 inches was inserted into the dilated bowel 1-2 cm
ove the upper end of the resected meconium–containing
gment; 15-25 cm of the thin tube was then inserted into the
stal small bowel. Anastomosis was performed around the in-
ing tube and the double-tube was brought out through the
ound after fixing the bowel to the abdominal wall. The same
ocedure was used in the cases of small bowel atresia (except
at resection could usually be avoided). Evacuation of bowel
ntents usually began on the 2nd day after operation and
ased on the 5th-6th day. The thick tube was clamped with
bsequent removal of the tubes on the 6th-7th day; the fistulas
aled quickly. Four of the 6 meconium ileus cases had no
mplications and survived, 1 died of pneumonia and associated
rdiac malformation, and 1 died from inability to restore bowel
nction postoperatively. One of the 9 with small bowel atresia
emature, 2000 g), died postoperatively. Two of the 8 survi-
g cases of small bowel atresia required a 2nd laparotomy due
suture line leakage and insufficient perforation of a thick
phragm, resp. The advantages of this technique are (1) ade-
ate decompression of the bowel, (2) adequate splinting of
anastomosis preventing kinking of the bowel, (3) the elimin-
on of or reduction of the amount of bowel resection, and (4)
collection of bowel contents passing through the thick tube
their reinjection, without loss, through the thin tube, and
initiation of oral feeding soon after surgery.

8 **THE HISTOLOGIC SPECTRUM OF PROXIMAL DODENAL BIOPSY IN ADULT MALES.** *(E.)*
ar, E. V. Jr. (VA Hosp., Durham, N. C.) and W. O. Dobbins
Amer J Med Sci 257(2):90-99, 1969.

tologic features of 81 peroral proximal duodenal biopsies
m 51 patients (all males, 20-79 yr old) with duodenal ulcer,
ign gastric ulcer, "X-ray negative dyspepsia" or various
onic diseases were compared with 65 biopsies obtained from
distal duodena of these same patients, and were correlated
h gastric secretory rates in 47 cases. The histology of the
ximal duodenum generally reflected that of the distal duo-
um. The slight-to-moderate increase in lamina propria cell
tent in the majority of proximal duodenal biopsies (79%)
the occasional slight-to-moderately blunted and shortened
earance of proximal duodenal villi, as compared to matched
nal biopsies, could easily be distinguished from pathological
es. Only 3 proximal biopsies and none of the distal biopsies
wed dense lamina propria cell content. Many proximal duo-
al biopsies appeared identical to the distal duodenal biopsies,
pt for frequent Brunner's glands in the former. The mean
al epithelial cell surface lengths did not differ significantly
he patient groups. Only in the duodenal ulcer group was
epithelial cell surface length of proximal biopsies significantly
r than that in distal biopsies. Lymph follicles were present
8 of 81 proximal biopsies and in 9 of 65 distal biopsies.
ina propria cell content and epithelial cell surface length
of proximal duodenal biopsies correlated poorly with maximal acid outputs. However, there was a significant inverse correlation between high acid output and low villus epithelial cell surface length in patients with gastric mucus cell metaplasia, and a significantly lower mean epithelial cell surface length in patients with duodenal ulcer disease compared with the other patient groups. These observations suggest that high acid secretion may influence proximal duodenal histology.

439 **EXPERIENCE WITH ELECTRICAL STIMULATION OF THE INTESTINE IN THE TREATMENT OF SURGICAL PARALYTIC ILEUS.** *(Sp.)* Martinez Peralta, O. (Munic. Hosp., Strasbourg, France), S. Babin and M. Lampert. *Prensa Med Argent* 55(30):1437-1441, 1968.

The electrode of an intestinal pacemaker was used to stimulate the antropyloric or duodenal regions in 21 patients, aged 27-74 yr, who developed paralytic ileus after abdominal surgery. Impulses had a duration of 5 sec, a potential of 25 volts, and a resistance of 1000 ohms. Electrical stimulation was successful in 14 of these 21 patients. In 2 cases it was used prophylactically 2 days after surgery. Failures are attributed to delay in the use of electrical stimulation, true mechanical obstructions, electrolyte disturbances and poor general condition in an elderly patient with a ruptured aortic aneurysm, poor technique, and individual factors. No side effects were seen.

440 **MORPHOLOGICAL CHANGES IN THE PROXIMAL PART OF THE SMALL INTESTINE FOLLOWING GASTRECTOMY.** *(Rus.)* Aruin, L. I. (All-Union Sci.-Res. Inst. Gastroent., Min. Health USSR, Moscow). *Arkh Pat* 30(10):63-68, 1968.

Histological and histochemical studies were made of specimens of small intestine, removed during surgery for dumping syndrome, from patients, aged 26-52 yr, who had been operated on for peptic ulcers 2.5 months to 15 yr before. No pathological changes were found in 20 of the 35 efferent loop specimens. Inflammatory, dystrophic, and atrophic changes were found in the remaining 15. These changes, most evident in the immediate vicinity of the anastomosis, included atrophy of the villi and infiltration and transformation of the epithelium into a type with all the characteristics of the gastric mucosa. This is considered to be an adaptation to free HCl which is not ordinarily present in the jejunum. Other changes in the efferent loop included villous infiltration and edema, disturbances in the RNA gradient of the villi, deformations of the villi and crypts of Lieberkühn, and transformation of the crypts of Lieberkühn into duodenal glands. Malabsorption is attributed to blockage of lymph vessels. Motility disturbances are due, at least in part, to myolysis and sclerosis of nerve ganglia. Pathological changes were found in 24 of the 25 duodena and in 22 of the 26 afferent loops examined. These consisted of mucosal atrophy, lymphoid and plasma cell infiltration, a reduction in the number of goblet cells, and hyperplasia and dilatation of the crypts of Lieberkühn and the duodenal glands. Macrophages containing neutral mucopolysaccharides and acid phosphatase were found in the villi of almost all patients with afferent loop syndrome, but in only 2 patients without it. In contrast to normal intestines, in these patients the alkaline phosphatase activity was lower in the proximal part (afferent loop) than in the distal part (efferent loop).

SMALL INTESTINE

441 ASPIRATION BIOPSY OF MUCOSA FROM THE SMALL INTESTINE IN ENTEROCOLITIS. *(Rus.)* Savoshchenko, I. S. (Inst. Nutrit., Acad. Med. Sci. USSR, Moscow), Z. M. Gadzhieva and M. M. Gurvich. *Arkh Pat* 30(10): 74-79, 1968.

A total of 25 aspiration biopsies were taken from 19 patients (3 men and 16 women, aged 19-55 yr) with chronic enterocolitis. Symptoms were mild in 14 cases, moderately severe in 4, and severe in 1. In mild cases the intestinal villi were of moderate height. The stroma had wide lymphatic spaces, dilated capillaries, and many cells with positive reactions for phenol oxidase. Epithelial cells on the villi and in the crypts had granular cytoplasm containing little RNA and, in some cases, vacuoles which contained no fat. In addition to the changes described above, 3 of the 4 patients with moderately severe symptoms had large amounts of nucleoproteins and mucoproteins in the intercellular spaces of the reticular stroma of the villi. Lipid-rich cells were found in the villous epithelium in 2 of these patients. In severe enterocolitis some of the villi were missing and the mucosal relief was flattened. Foci of depressed epithelial cells containing large amounts of lipids were found on the mucosal surface. Desquamation was seen in some areas of the epithelium. No goblet cells were present and plasma cells were found infrequently. Changes seen after treatment of mild and moderately severe enterocolitis included a large increase in the number of wandering cells in the villous epithelium, a decrease in the number of cells containing phenol oxidase, and the appearance of cytoplasmic lipids. After 2 months of treatment no appreciable changes had occurred in intestinal mucosa from the patient with severe enterocolitis.

442 PATHOPHYSIOLOGY OF SMALL INTESTINAL RESECTION IN MAN. *(E.)* Winawer, S. J. (Cornell U. Med. Coll., New York City) and N. Zamcheck). Pp. 339-356 in *Progress in Gastroenterology*. Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

443 INTESTINAL INTUBATION IN THE TREATMENT OF RECURRENT OBSTRUCTION OF THE SMALL INTESTINE. *(Gr.)* Karamanolis, S. (Surg. Clin. B, Aristotelian U. Salonika, Greece), A. Antoniades, P. Kalakonas and G. Makris. *Acta Chir Hellen* 95(3):329-340, 1968.

444 LEIOMYOMA OF THE DUODENUM AS A CAUSE OF OBSTRUCTIVE JAUNDICE. *(Pol.)* Gábrys, A. (PKP Hosp., Katowice, Poland) and Z. Hajduk. *Pol Tyg Lek* 23(49):1893-1894, 1968.

445 PRIMARY AND SECONDARY ALTERATIONS IN THE ILEOCECAL VALVE. *(It.)* Bettinelli, G. (Maggiore Hosp., Milan, Italy). *Minerva Gastroent* 14(2): 71-83, 1968.

446 DIETETIC THERAPY FOLLOWING RESECTION OF THE SMALL BOWEL. *(Cz.)* Skála, I. (Inst. Study Human Nuttit., Prague, Czechoslovakia) and J. Horáčková. *Cesk Gastroent Vyz* 22(5):340-348, 1968.

447 AN EXPERIMENTAL STUDY OF THE PREVENTION OF INTESTINAL ADHESION. *(Jap.)* Maeda, Y. (Fac. Med., Kyushu U., Fukuoka, Japan). *Acta Med (Fukuoka)* 38(3):469-484, 1968.

448 THE PROBLEM OF THE SO-CALLED DUODENITIDES. *(Cz.)* Benysek, L. (Med. Fac., Purkinje U., Olomouc, Czechoslovakia), R. Kodoušek and Z. Kojecký. *Cesk Gastroent Vyz* 22(5):289-292, 1968.

449 AN UNUSUAL FORM OF INTESTINAL LYMPHANGIECTASIS. *(Ger.)* Gaissmaier, U. (Med. Polyclin., U. Tubingen, Germany) and G. Bürkle. *Med Welt* 19(42):2292-2298, 1968.

450 TWO CASES OF LYMPHOSARCOMA OF THE LOWER DIGESTIVE TRACT. *(Fr.)* Lambert-Lecler, G. (St. Joseph Clin., Liège, Belgium), A. Cornil, R. Lombard, L. Lewalle and C. Drèze. *Rev Med Liege* 23(21): 667-672, 1968.

451 SMALL INTESTINE ATROPHY IN THE ADULT. *(Fr.)* Cerf, M. and P. Dupuy. *Vie Med (Spec)* 49:1267-1282, 1968.

452 PEUTZ-JEGHERS SYNDROME: A DIAGNOSTIC AND THERAPEUTIC DILEMMA, CASE REPORT AND REVIEW OF THE LITERATURE. *(E.)* Bernell, W. R. (U. Oklahoma Med. Ctr., Oklahoma City). *J Okla Med Ass* 61(11):533-536, 1968.

453 JEJUNAL DIVERTICULITIS SIMULATING APPENDICITIS: REVIEW OF THE LITERATURE. *(E.)* Carter, O. B. Jr. (Mobile Gen. Hosp., Ala.) and H. S. J. Walker Jr. *Southern Med J* 61(12):1374-1377, 1968.

454 HERNIA THROUGH THE FORAMEN OF WINSLOW: WITH CASE REPORT. *(E.)* Carmichael, J. L. (Birmingham, Ala.) and J. D. Carmichael. *Southern Med J* 62(2):141-144, 1969.

455 CORRELATION CONFERENCES IN RADIOLOGY AND PATHOLOGY. *(E.)* Finby, N. (St. Luke's Hosp. Ctr., New York City) and C. F. Begg. *New York J Med* 68(18):2437-2440, 1968.

456 LEIOMYOSARCOMA OF THE SMALL BOWEL DEMONSTRATED BY SELECTIVE SUPERIOR MESENTERIC ANGIOGRAPHY. *(E.)* Leone, A. J. (Johns Hopkins Med. Inst., Baltimore, Md.) and C. S. Bryan. *J Canad Ass Radiol* 29(3):126-129, 1968.

457 NONOPERATIVE TREATMENT OF MECONIUM ILEUS: REPORT OF A CASE. *(E.)* Simpson, T. E. (U. Minnesota, Rochester), H. B. Lynn and E. O. Burgert. *Mayo Clin Proc* 43(10):725-729, 1968.

458 LYMPHANGIECTATIC CYSTS OF THE SMALL BOWEL. *(E.)* Shilkin, K. B. (Royal Perth Hosp., Western Australia), B. J. Zerman and J. B. Blackwell. *J Path Bact* 96(2):353-358, 1969.

459 **ACUTE INTESTINAL HEMORRHAGE DUE TO NEUROFIBROMA OF A MECKEL'S DIVERTIC-ULUM.** *(It.)* Capecchi, G. (Maggiore Hosp., Milan, Italy). *inerva Chir* 23(19):1036-1041, 1968.

460 **A CASE OF THE INTESTINAL FORM OF ANTHRAX TERMINATING IN RECOVERY FTER SURGERY.** *(Rus.)* Patalakh, P. K. (Munic. Hosp. nfect. Dis., Dnepropetrovsk, USSR) and V. S. Gorbanovskii. *ovet Med* 31(10):149-150, 1968.

61 **COUMADIN INDUCED SMALL BOWEL OBSTRUCTION: REPORT OF A CASE.** *(E.)* hamberlain, M. S. (Wilford Hall USAF Hosp., Lackland Air orce Base, Texas) and W. E. Evans. *Ann Surg* 169(1):145-147, 969.

62 **PEUTZ-JEGHERS SYNDROME WITH METASTASES TO AN ABDOMINAL INCISION.** *(E.)* ackman, S. (U. Wisconsin Med. Ctr., Madison), G. Perna and . Gossett. *Arch Surg* 91(1):99-102, 1969.

63 **THE EMERGENCY MANAGEMENT OF LATERAL DUODENAL FISTULA BY PAN-REATICODUODENECTOMY.** *(E.)* Musicant, M. E. (UCLA Sch. Med., Los Angeles, Calif.) and J. C. Thompson. *Surg Gynec Obstet* 128(1):108-114, 1969.

464 **SOME IMMUNOLOGICAL FACTORS IN SMALL INTESTINE DISEASE: A REVIEW.** *(E.)* Eidelman, S. (U. Washington, Seattle). *Amer J Clin Nutr* 21(9): 1110-1114, 1968.

465 **THE SURGICAL MANAGEMENT OF MASSIVE BOWEL RESECTION.** *(E.)* Cywes, S. (Dept. Pediat. Surg., U. Cape Town, South Africa). *J Pediat Surg* 3(6): 740-748, 1968.

466 **THE EXPERIMENTAL STUDY OF THE FAT ABSORPTION FOLLOWING MASSIVE RESECTION OF THE SMALL BOWEL AND INTERPOSITION OF ANTIPERISTALTIC BOWEL SEGMENTS.** *(E.)* Ushiyama, T. (Nichidai U. Sch. Med., Japan). *Nichidai Ig Z* 27(11):1236-1241, 1968.

467 **CASE OF LEIOMYOSARCOMA OF THE DUODENUM AND A REVIEW OF THE LITERATURE.** *(E.)* Olurin, E. O. (U. Coll. Hosp., Ibadan, Nigeria) and T. F. Solanke. *Gut* 9(6):672-677, 1968.

See also: 2,79,101,194,269,276,280,284,360,361,375,376,425,617,639,646,650,662,856

468 **JEJUNOGASTROPLASTY IN REPEAT OPERATIONS FOR ANASTOMOTIC ULCERS AND JEJUNAL ULCERS.** *(Rus.)* Zakharov, Ie. I. (Crimean Med. Inst., Simferopol', USSR) and V. D. Sidorenko. *Klin Khir (Kiev)* (11):55-58, 1968.

Of 106 patients with anastomotic and jejunal ulcers, 60 (53 men, 7 women) were given jejunogastroplasties and 46, Billroth II gastrectomies. Resections of the stomach and small intestine were performed in 88 cases (50 by jejunogastroplasty and 38 by Finsterer's procedure). The stomach, small intestine, and transverse colon were resected in 15 patients with fistulas between the stomach and transverse colon (7 by Finsterer's procedure and 8 by jejunogastroplasty). At least 75% of the stomach was removed, and the proximal end of the jejunum was anastomosed end-to-side with the stomach and the distal end side-to-side with the duodenal stump. Then the free ends of the jejunum were anastomosed end-to-end. No patients died after resections of the stomach and small intestine, but 5 died when these procedures were combined with a resection of the transverse colon. Of those who died 2 had undergone Finsterer's procedure and 3, jejunogastroplasties. One patient who had undergone jejunogastroplasty developed an anastomotic ulcer between the stomach and transplanted jejunum 1 yr after surgery. Good results were obtained by making a high resection with the remaining portion of the transplant. Dumping syndrome was present in 14 out of 27 patients who had undergone Billroth II resections and in 3 patients who had undergone gastroenterostomies. It disappeared in all patients after jejunogastroplasty. After resections of the stomach, small intestine, and transverse colon 1 patient developed an internal fistula of the small intestine which closed spontaneously 1 month later. This operation gave unsatisfactory functional results in 2 patients who developed abdominal pain, dyspepsia, and symptoms of chronic colitis.

469 **CHANGES OCCURRING IN BLOOD SUGAR AND INSULIN LEVELS AFTER VAGOTOMY AND PYLOROPLASTY FOR ULCERS OF THE DUODENAL BULB.** *(Fr.)* Fourlinnie, J. C. (Adult Surg. Clin. East, Lille, France), B. Combemale, M. Lehut, C. Proye, G. Lagache and M. Linquette. *Lille Med* 13(9):987-989, 1968.

Serum insulin levels were determined by the method of Hales and Randle in 15 men who had undergone subphrenic vagotomy and pyloroplasty 10 days to 3 yr before. Measurements of insulin and blood sugar were made after fasting and after oral administration of 1 g glucose/kg body weight. Of the 8 patients with normal glucose tolerance curves, 5 had low normal serum insulin levels, 2 had reduced insulin levels, and 1 had elevated insulin levels. Of the 4 patients with flattened glucose tolerance curves, one had reduced serum insulin levels and 3 had elevated ones. One patient with a diabetic glucose tolerance curve had low normal serum insulin levels. Serum insulin levels were elevated in 2 patients whose blood sugar levels reached abnormally high maxima and decreased very quickly. Thus, there was a correlation between sugar and insulin levels in 11 of these 15 patients. Hollander's insulin test showed that gastric acid secretion persisted in only 2 of the 15 patients. One of these had a flattened glucose tolerance curve and the other a diabetic type curve. Since normal values were obtained for the coefficient of glucose assimilation in 4 vagotomized subjects after they were given glucose i.v., it is concluded that the vagus nerve need not innervate the pancreas for glucose homeostasis.

470 **VAGOTOMY AND DRAINAGE IN THE TREATMENT OF GASTRIC ULCER.** *(E.)* McNeill, A. D. (Glasgow Royal Infirm., Scotland), W. A. F. McAdam and J. S. F. Hutchison. *Surg Gynec Obstet* 128(1):91-96, 1969.

Among 33 patients (20 men and 13 women, average age 51 yr) with gastric ulcers (6 prepyloric and 27 on the lesser curvature, plus a duodenal ulcer in 8 cases, average duration of symptoms 6 yr), 21 were treated by anterior selective vagotomy and pyloroplasty, 11 received truncal vagotomy and either pyloroplasty (8) or gastrojejunostomy (3), and 1 was treated by pyloroplasty alone. The ulcers were not excised. After an average follow-up of 2.5 yr, 29 patients were clinically and roentgenographically cured, 2 had died of gastric carcinoma (1 definite and 1 probable), 1 had died of a postoperative pulmonary embolus following leakage from the pyloroplasty, and 1 benign ulcer had failed to heal. Various possible mechanisms for the pathogenesis of gastric ulcers are discussed.

471 **COMPARISON OF THE THERAPEUTIC ACTION OF TWO ANTICHOLINERGICS, ANTRENYL ROCHE AND PREPARATION VUFB 3113, IN PEPTIC ULCER.** *(Cz.)* Ronsky, R. (Fac. Gen. Med., Charles U., Prague, Czechoslovakia), V. Šmejkal and L. Stamidis. *Sborn Lek* 70(11):340-344, 1968.

The effects of 5 mg Antrenyl (oxyphenonium bromide) t.i.d. and 2.5 mg VUFB 3113 (oxyphenhydrazone bromide) t.i.d. were compared in a double-blind study on 16 patients (10 men and 6 women, aged 18-60 yr) who had had peptic ulcers for less than 5 yr and who did not require immediate surgery. Tw of these patients had stomach ulcers and 14 had duodenal ulcers. Analysis with the ^{2}-test of subjective and clinical symptoms, scored on a point basis, X-ray findings after 1 mon of treatment, and recurrences in an 18-month period showed no significant differences between these 2 anticholinergics. Th incidence of side effects and weight gains were about the same in both groups. Two patients in each group finally required surgical treatment.

472 **BLOOD ACETYLCHOLINE AND CHOLINESTERASE ACTIVITY IN THE BLOOD AND GASTRIC MUCOSA IN PATIENTS WITH COMPLICATED PEPTIC ULCERS.** *(Rus.)* Gotsuliak, O. F. (Munic. Clin. Hos No. 3, Chernovtsy, USSR). *Ter Arkh* 40(10):91-94, 1968.

Blood acetylcholine, cholinesterase activity in the blood and gastric mucosa, blood pepsinogen, and uropepsin levels were determined in 149 patients with peptic ulcer complications and in 30 with simple peptic ulcers (145 males and 34 female Stomach ulcers were present in 19 and duodenal ulcers in 16 Blood acetylcholine levels were significantly lower in patients with periduodenitis and perigastritis, pyloric stenosis, bleeding ulcers, penetrating ulcers, and perforating ulcers than in patie with simple ulcers. Of 94 patients with detectable levels of acetylcholine in the blood, 59 had hyperchlorhydria. High blood acetylcholine concentrations were often associated wit high gastric acidity and high uropepsin levels with low blood vels of acetylcholine in patients with bleeding, penetrating, nd perforating ulcers. Gastric motility was also correlated ith acetylcholine levels in the blood. Blood cholinesterase vels in patients with ulcer complications were significantly wer than normal levels or those found in patients with simple cers. The blood levels of this enzyme were lowest in patients ith bleeding, penetrating, and perforating ulcers and in those ith liver involvement. In patients with ulcer complications, olinesterase levels in the gastric mucosa were significantly wer than those in the blood.

3 SPECIFIC INHIBITION OF GASTRIC PEPSIN IN THE TREATMENT OF GASTRIC ULCER.

.) Zimmon, D. S. (VA Hosp., New York, N. Y.), G. Miller, Cox and M. A. Tesler. *Gastroenterology* 56(1):19-23, 1969.

e effect of a sulfated polysaccharide inhibitor of gastric psin (SN-263) on the healing rate of gastric ulcers was studied double-blind and sequential trials in hospitalized patients. ealing rate was determined from changes in the surface area ulcers estimated by serial radiography, and confirmed by stroscopy. Ten patients (all males; 2 less than 45, 6 between and 64, and 2 over 65 yr old) treated with SN-263 (0.5 g times daily) in the double-blind trial had a mean decrease ulcer size of 9.14 mm^2/day (over 25.5 ± 8.6 days), while cers in 9 control patients (8 males, 1 female; 1 less than 45, etween 45 and 64, and 3 over 65 yr old) had a mean de-ase in ulcer size of 2.21 mm^2/day (over 28.2 ± 9.3 days); s difference is statistically significant ($p < 0.05$). In 5 se-entially treated patients, selected because of their failure to ieve adequate healing during the initial period of therapy, ere given SN-263 after a vigorous antacid program and 3 eived SN-263 after placebo therapy. The mean decrease in er size was 8.5 mm^2/day during SN-263 treatment and 1.6 ^{2}/day during the control period ($p < 0.10$). These data firm the role of gastric proteolytic activity in chronic gas- ulcer, and demonstrate the efficacy of this therapeutic nt in accelerating the healing rate of gastric ulcers.

PSYCHOSOMATIC STUDIES ON PATIENTS WITH BENIGN GASTRIC LESIONS. *(Jap.)*

ma, T. (Sch. Med., Showa U., Japan). *J Showa Med Ass* 8):480-495, 1968.

attempt was made to relate the etiology of peptic ulcers postgastrectomy symptoms to the patients' mentality, onality and autonomic nervous lability on the basis of the nesota Multiphasic Personality Interview (MMPI) and the holyl test. Patients with benign gastric lesions admitted he hospital for gastrectomy were divided into 3 groups: 7 studied preoperatively, 2) 189 studied postoperatively, 3) 41 studied both pre- and postoperatively. In the pre-ative group, patients with peptic ulcers had more neurotic encies, psychosomatic complaints and autonomic instability patients with other gastric lesions. In the postoperative p, neurotic tendencies were recognized in 80% of males and % of females with the dumping syndrome, and postoperative plaints were closely related to autonomic instability. In atients studied both pre- and postoperatively, preoperative otic tendencies were associated with a higher incidence of operative complaints, particularly the dumping syndrome, the neurotic tendencies increased after gastrectomy in those nts who developed postgastrectomy complications (with the ption of the dumping syndrome).

475 PEPTIC ULCERATION OF THE POSTBULBAR PORTION OF THE DUODENUM.

(E.) Mullens, J. E. (Wellesley Hosp., Toronto, Ont., Canada) and G. S. Bird. *Canad J Surg* 12(1):27-31, 1969.

The case histories of 6 patients (5 males and 1 female, 34-62 yr old) with ulcers in the 2nd portion of the duodenum are presented to illustrate the problems of postbulbar ulceration. In each patient the ulceration was proximal to the duodenal papilla; in 4 patients the ulcer was not reported by the radiologist (incorrect diagnoses of hiatal hernia, duodenitis, and previous and active ulceration in the 1st portion of the duodenum) and in 1 case the ulcer was not identified by exploratory laparotomy and pylorotomy. The complications encountered were hemorrhage (4), intractability (1), and choledochoduodenal fistula formation (1); no patients presented with obstruction. In 3 patients, vagotomy and a drainage procedure were performed (Finney pyloroplasty in 1 and gastroenterostomy in 2), 2 patients had partial gastrectomies, and 1 had a pancreaticoduodenectomy (inflammatory reaction mistaken for a carcinoma); there were no postoperative deaths. It is concluded that ulcers in the 2nd portion of the duodenum can be demonstrated radiographically if kept in mind by the radiologist. A Finney pyloroplasty and vagotomy in these patients is felt to give results comparable to those achieved in the treatment of the usual type of duodenal ulceration.

476 THE SIGNIFICANCE OF HORMONAL REACTIONS OF THE ADRENAL CORTEX DURING PEPTIC ULCER DISEASE.

(Ger.) Bojanowicz, K. (1st Med. Clin., Med. Acad., Lodz, Poland). *Z Gastroent* 6(5):368-374, 1968.

Electrolytes in the erythrocytes, plasma, and urine of 90 ulcer patients (60 men and 30 women, aged 17-68 yr) were determined by flame photometry before and after treatment with a low-potassium diet and desoxycorticosterone trimethylacetate in depot form. In addition, urinary 17-ketogenic steroids and 17-ketosteroids were determined in 35 patients and urinary aldosterone in 15. As clinical symptoms of the disease progressed, significant decreases occurred in Na and Cl levels and significant increases in the K level. These changes were more pronounced in the erythrocytes than in the plasma. Secretion of glucocorticoids increased. Aldosterone excretion decreased, on the average, from 5.4 to 4.6 μg and the ratio between μg aldosterone and mg ketogenic steroids decreased from 0.6 to 0.55, while the ratio of 17-ketogenic steroids to 17-ketosteroids increased from 1.04 to 1.33. In addition to healing the ulcers, desoxycorticosterone trimethylacetate caused increases in Na and Cl levels and a decrease in the K level in the erythrocytes and, to a smaller extent, in the plasma. Urinary excretion of Na and Cl decreased and that of K increased. Aldosterone increased to 12.9 μg, the ratio of aldosterone to 17-ketogenic steroids increased to 1.17, while the ratio of 17-ketogenic steroids to 17-ketosteroids decreased to 0.76. During stabilization the electrolyte levels and urinary hormone excretion reached values between the means for active peptic ulcers and those found during healing. Bleeding ulcers were associated with erythrocyte Na levels and erythrocyte Na:K ratios which were smaller and 17-ketogenic steroid:17-ketosteroid ratios which were larger than those associated with simple ulcers and no manifest bleeding. Similar differences were seen between patients with peptic ulcers and those with chronic gastritis and no ulcer.

477 **A CONTROLLED TRIAL OF CARBENOXOLONE SODIUM CAPSULES IN THE TREATMENT OF DUODENAL ULCER.** *(E.)* Montgomery, R. D. (East Birmingham Hosp., England), I. H. Lawrence, D. J. Manton, K. Mendl and P. Rowe. *Gut* 9(6):704-706, 1968.

In a controlled trial of carbenoxolone sodium positioned-release capsules (Duogastrone), 22 randomly-selected outpatients with radiologically proven duodenal ulcers (less than 70 yr old) received 200 mg carbenoxolone sodium daily (50 mg capsules 4 times a day before meals) for 6 weeks and antacid therapy when needed, while 22 control outpatients received antacid therapy only. Radiological assessment was made at 3, 6 and 12 weeks, with a clinical follow-up at 6 months. At 6 weeks, 13 experimental cases and 8 controls were symptom-free with no local tenderness. Although 14 patients continued to take 1 carbenoxolone capsule twice a day for the second 6 weeks, no significant difference could be detected between the carbenoxolone and control groups after either 12 weeks or 6 months. X-rays indicated healing or improvement in 9 experimental and 3 control cases, but this difference is not statistically significant. Fluid retention and mild hypokalemia developed in 2 patients on carbenoxolone, one of whom also developed hypertension.

478 **INFLUENCE OF PREGNANCY UPON GASTRIC ULCERS INDUCED BY RESTRAINT.** *(E.)* Luther, I. G. (U. Minnesota Med. Sch., Minneapolis), G. T. Heistad and S. B. Sparber. *Psychosom Med* 31(1):45-56, 1969.

To determine whether pregnancy protects against ulcer induction due to stress, gastric ulcers were induced in Sprague-Dawley rats by a modification of Senay and Levine's technique of restraint in a cold environment. No protection against ulceration was found in early pregnancy (14 days); 7 of 11 pregnant mice (63.9%) developed ulcers rated 4.7 ± 0.9 on a 10-point scale of ulcer severity and 21 of 31 control mice (67.7%) developed ulcers with a severity of 4.6 ± 0.4. In 20-day pregnant animals, ulcer severity was significantly greater (7.2 ± 0.6) than in the control or 14-day-pregnant groups, with 18 of 20 mice (90.0%) showing ulcers rated 4 or greater in severity. These findings are consistent with clinical reports that early pregnancy does not protect against ulceration and that late pregnancy has an aggravating effect, and are contrary to the observations, made with chemically-induced ulcers, that pregnancy exerts a protective effect.

479 **EMERGENCY VAGOTOMY AND PYLOROPLASTY FOR PERFORATED DUODENAL ULCER: STUDY OF 73 CASES.** *(E.)* Machayya, M. G. (North Lansdale Hosp., Furness, England). *Brit Med J* 4(5624):155-156, 1968.

Of 73 unselected patients (20-81 yr old) with perforated duodenal ulcers treated by vagotomy and pyloroplasty, 52 were operated on within 6 hr of perforation, while 21 were operated on after a longer interval. Of the 52 treated within 6 hr of perforation, 13 (25%) developed postoperative complications (basal pneumonia in 6, wound infection in 7) which responded rapidly to antibiotic treatment. In the group of patients operated on 6 hr or longer after perforation, 10 (47.6%) developed postoperative complications (wound infection in 3, pneumonia in 3, subphrenic abscess, hypovolemic shock, cardiogenic shock, obstructive jaundice in 1 patient each). There were 4 postoperative deaths: 1 opereated on within 4 hr of perforation died of peritonitis and 3 treated more than 12 hr after perforation died due to irreversible shock, myocardial infarction, and prolonged unconsciousness, resp. Follow-up examinations (6 months-5 yr) revealed similar results for elective vagotomy and pyloroplasty.

480 **SURGERY FOR DUODENAL ULCER: A COMPARISON OF THE RESULTS OF FOUR STANDARD OPERATIONS.** *(E.)* Nelson, P. G. (Royal Melbourne Hosp., Australia). *Med J Aust* 2(13):522-528, 1968.

The results of 4 different operations (gastrectomy, vagotomy with antrectomy, vagotomy with pyloroplasty, and vagotomy with gastroenterostomy) were compared in a blind personal-interview study on 205 patients (168 males and 37 females) with duodenal ulcers. No deaths occurred after vagotomy and drainage procedures, but 2 deaths after gastrectomy and 2 death after vagotomy and antrectomy were among the 72 patients lost to follow-up out of an original group of 277. Operative morbidity, overall functional results, and the incidence of the dumping syndrome (30%) were the same for each procedure. Recurrent ulceration occurred least often with gastrectomy (3 cases), slightly more often with vagotomy and antrectomy (5 cases), and most often with vagotomy and pyloroplasty or gastroenterostomy (8 cases each). Symptoms of esophageal reflux were seen in some cases after each procedure, but severe persistent symptoms were not seen after gastrectomy. Reflux or hiatus hernia could be radiographically demonstrated in 50% of cases with symptoms of reflux. Moderate or mild bilious vomiting occurred significantly more often after gastrectomy (20%) than with the other procedures (3-10%), but the incidence of severe bilious vomiting was the same for all procedures (3.3-6.5%). Hypoglycemic episodes were seen more frequently after vagotomy with antrectomy (11%) than with the other procedures (0-4.9%). Aberrations of bowel function were noted in 25-35% of cases after vagotomy regardless of the associated procedure, but severe aberrations were uncommon; after gastrectomy, aberrations of bowel function were noted in 13%. Weight loss was seen with all procedures, but was more common after gastrectomy. There appears to be no large difference between any of these procedures and it is reasonable to use any of them in a given situation appropriate for the individual patient.

481 **SOME BIOCHEMICAL FEATURES OF METHIONINE METABOLISM IN DUODENAL ULCER THE EFFECT OF UNLABELED ACETYLMETHIONINE ON EXCRETION OF ^{35}S-LABELED METHIONINE METABOLITES.** *(Fr.)* Szantay, I. (3rd Med. Clin., Cluj, Romania) and S. Cotul. *Acta Gastroent Belg* 31(10):700-706, 1968.

Urinary excretion of total ^{35}S and ^{35}S-labeled amino acids an amines was measured in 15 patients with active duodenal ulce before and after i.v. administration of 2-5 g unlabeled acetylmethionine/day for 7-14 days. None of these patients had liv disease. The dose of acetylmethionine administered was 2-3 times the methionine requirement determined for each patient on admission. Urinary excretion of total ^{35}S and ^{35}S-labeled amino acids and amines was very low and, in 9 of these patien was not increased by administration of acetylmethionine. In the rest these values tended to return to normal. In contrast to controls, patients with duodenal ulcers excreted large amou of ^{35}S-labeled taurine, a methionine metabolite, and little or

onmetabolized ^{35}S-labeled methionine. These findings sug-
est that there is a temporary methionine deficiency associated
ith active duodenal ulcers and that acetylmethionine may be
erapeutically useful.

82 **A STUDY OF THE VAGUS NERVES AT THE LOWER END OF THE ESOPHAGUS, WITH
PECIAL REFERENCE TO DUODENAL ULCER AND ACUTE
ASTRO-DUODENAL ULCERATIONS.** *(E.)* Gravgaard, E.
ent. Hosp., Randers, Denmark). *Scand J Gastroent* 3(3):327-
3, 1968.

dissection of the vagus nerves at the level of the lower third
the esophagus and around the stomach was made during 151
topsies, comprising 26 cases of duodenal ulcer, 9 cases of
ute gastroduodenal ulceration, and 116 controls. A simple
gal pattern with only 1 left and 1 right vagal trunk was found
58% and 36% of the duodenal ulcer and control cases, resp.
fference not statistically significant). In 10% of all cases, a
hly complex vagal pattern was found, without identifiable
in trunks. The diameter of the vagal trunks was significantly
ater in both ulcer groups as compared to the controls (3.8
n and 2.2 mm, resp.). In another group of 47 autopsies (8
odenal ulcers, 5 acute ulcerations, 34 controls), the cross-sec-
nal area of the vagal trunks at the lower end of the esophagus
s measured microscopically by taking the product of longest
shortest diameters of the nerve sections. The amount of
ve in the perineural membrane was measured the same way.
cases with ulcers, the transverse area of the vagus nerves was
ificantly greater than in the controls (4.2 and 2.8 mm^2,
.). The amount of typical nerve tissue in the nerve itself
also significantly greater in the ulcer group. These findings
e implications both for vagotomy and for the constitutional
disposition to peptic ulcer disease.

3 **USE OF THE RAT IN THE EXPLORATION OF EXPERIMENTAL PEPTIC ULCER AND SEQUELAE
GASTRECTOMY.** *(E.)* Lambert, R. (Edouard-Herriot
p., Lyon, France). Pp 40-66 in *Progress in Gastroenterology,*
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ia, São Paulo, Brazil). *Folha Med* 57(3):369-385, 1968.

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tyn, Poland). *Wiad Lek* 21(18):1629-1631, 1968.

THE PATHOGENESIS OF GASTRIC ULCER. *(Fr.)* Betz, E. H. (Lab. Path. Anat., U. Liege,
um). *Rev Med Liege* 23(18):545-548, 1968.

**ULGASTRIN-ROLL THERAPY IN THE AMBULATORY TREATMENT OF INFLAMMATORY
ASES OF THE GASTROINTESTINAL TRACT.** *(Ger.)*
D. (Med. Clin., Justus-Liebig U., Giessen, Germany).
rzt 44(32):1599-1600, 1968.

BLEEDING FROM THE STOMACH AND DUODENUM FOLLOWING UROLOGICAL SURGERY.

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489 **OPINIONS ON THE PATHOGENESIS OF GASTRODUODENAL ULCERS.** *(Sp.)* Meeroff, M. (Buenos Aires, Argentina). *Medicina (Mex)* 48(1048):597-599, 1968.

490 **SOME ASPECTS OF THE NATURAL HISTORY OF GASTRODUODENAL ULCERS IN ARGENTINA.** *(Sp.)* Meeroff, M. (Prof. Dr. G. Araoz Alfaro Polyclin., Lanus, Buenos Aires, Argentina), O. N. Pellizari, R. Celestino, A. Folino, A. M. Luis, N. Goschinsky and J. C. Meeroff. *Medicina (Mex)* 48(1048):600-604, 1968.

491 **ACUTE COMPLICATIONS OF GASTRODUODENAL ULCERS: MASSIVE DIGESTIVE TRACT HEMORRHAGE, PERFORATION INTO THE PERITONEAL CAVITY, AND THE PYLORIC SYNDROME.** *(Sp.)* Meeroff, M. (Prof. Dr. G. Araoz Alfaro Polyclin., Lanus, Buenos Aires, Argentina), O. N. Pellizari, R. Celestino, A. Folino, A. M. Luis, N. Goschinsky and J. C. Meeroff. *Medicina (Mex)* 48(1048): 605-610, 1968.

492 **THE BASIC SURGICAL TREATMENT OF GASTRODUODENAL ULCERS.** *(Sp.)* Lopez Esnaurrizar, M. *Medicina (Mex)* 48(1047):594-596, 1968.

493 **ANASTOMOTIC PEPTIC ULCER FOLLOWING RESECTION OF THE STOMACH FOR CANCER.** *(It.)* Luttichau, F. and A. Platania. *Chir Gastroent* 2(3):338-342, 1968.

494 **A STUDY OF THE SERUM PROTEIN PICTURE, SERUM IRON LEVELS, AND THE ACTIVITY OF SOME ENZYMES IN PATIENTS WITH GASTRODUODENAL ULCERS.** *(It.)* Romeo, S. (Inst. Surg. Symptomatol., U. Catania, Italy), S. Libra and G. Gruttadauria. *Chir Gastroent* 2(3):316-325, 1968.

495 **CLINICAL DIFFERENCES BETWEEN GASTRIC ULCERS WITH AND WITHOUT DUODENAL DEFORMITY.** *(E.)* McCray, R. S. (Boston City Hosp., Mass.), E. J. Ferris, T. Herskovic, S. J. Winawer, J. H. Shapiro and N. Zamcheck. *Ann Surg* 168(5):821-823, 1968.

496 **MODERN CONCEPTS OF ETIOLOGY AND PATHOGENESIS OF PEPTIC ULCER: DISORDERS OF THE REGULATING MECHANISMS.** *(E.)* Ryss, S. (Acad. Med. Sci., Leningrad, USSR) and E. Ryss. *Scand J Gastroent* 3(5):513-524, 1968.

497 **PYLORIC CHANNEL SYNDROME: TREATMENT BY VAGOTOMY AND PYLOROPLASTY.** *(E.)* Edelson, Z. C. (St. Vincent Hosp., Portland, Ore.) and D. J. Brown. *Northwest Med* 67(10):980-985, 1968.

498 **DELAYED RECURRENCE OF GASTRIC ULCER FOLLOWING VAGOTOMY AND DRAINAGE PROCEDURES.** *(E.)* Zahn, R. L. (VA Hosp., Long Beach, Calif.), E. A. Stemmer, L. W. Hom and J. E. Connolly. *Amer Surg* 34(11):757-761, 1968.

499 A CASE OF COEXISTING DUODENAL ULCERATION AND IDIOPATHIC STEATORRHEA. *(E.)* Finlayson, N. D. C. (Royal Infirm., Edinburgh, Scotland), D. J. C. Shearman and R. H. Girdwood. *Gastroenterology* 55(5):626-631, 1968.

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502 PEPTIC ULCER PERFORATION OF THE GASTRODUODENAL ARTERY COMPLEX: CLINICAL FEATURES AND OPERATIVE CONTROL. *(E.)* Berne, C. J. (U. Southern California Sch. Med., Los Angeles) and L. Rosoff. *Ann Surg* 169(1):141-144, 1969.

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505 GASTRIC SURGERY FOR PEPTIC ULCER DISEASE. *(E.)* Weinstein, E. C. (Valley Presbyterian Hosp., Van Nuys, Calif.). *Med Trial Techn Quart* 15(2): 47-54, 1968.

506 THE INCIDENCE OF PEPTIC ULCERS IN CHRONIC LEAD POISONING. *(Pol.)* Koziolowa, H. (1st Clin. Int. Dis., Med. Acad., Warsaw, Poland). *Pol Arch Med Wewnet* 41(2):215-220, 1968.

507 ANASTOMOTIC ULCERS AFTER GASTROJEJUNOSTOMY. [CASE REPORT] *(Rus.)* Toskin, K. D. (Crimean Med. Inst., Simferopol', USSR) and Ie. A. Sobeshchanskaia. *Klin Khir (Kiev)* (11):59-60, 1968.

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509 DUODENAL ULCER DEVELOPMENT AND TWO DUODENAL PERFORATIONS IN AN A ADOLESCENT AFTER CORTISONE THERAPY. *(Bul.)* Grigorov, G. (I. P. Pavlov Higher Med. Inst., Plovdiv, Bulgaria) and F. Mitov. *Khirurgiia (Sofiia)* 21(5):511-512, 1968.

510 USE OF METOCLOPRAMIDE IN THE TREATMENT OF PEPTIC ULCERS AND FUNCTIONAL DISORDERS OF THE DUODENUM. *(Cz.)* Kocián, J. (Res. Inst. Human Nutrit., Prague, Czechoslovakia) and J. Kociánová. *Cesk Gastroent Vyz* 22(6):376-378, 1968.

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515 BLEEDING FROM PEPTIC ULCERS. *(Fr.)* Marchay, P. *Vie Med (Spec)* 49:1431-1443, 196

516 LATE COMPLICATIONS FROM SURGERY FO PEPTIC ULCERS. *(Fr.)* Chaubin, F. and P. Simon. *Vie Med (Spec)* 49:1445-1472, 1968.

517 EFFECT OF DURATION OF ENVIRONMENTA STRESS ON STOMACH ULCERATION AND ADRENAL ASCORBIC ACID. *(E.)* Pare, W. P. (VA Hosp., Perry Point, Md.). *Psychol Rep* 23(3- Pt. I):683-688, 1968.

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See also: 81,82,107,277,316,334,356,367,369,380,411,415,417,418,662

9 **ARTHRALGIAS AND ILEOSACRAL ARTHRITIS IN REGIONAL ENTERITIS.** *(Ger.)* Wagner, A.
ed. Polyclin., U. Heidelberg, Germany). *Deutsch Med Wschr*
(1):13-17, 1969.

ports are presented for 5 patients (4 males and 1 female,
d 26-45 yr) with histories of regional enteritis who developed
osacral arthritis (2 cases) or arthralgias (5 cases) involving
nful limitation of movement in the large joints, knees, shoul-
s, and ankles. Only 1 patient had warm, swollen joints.
oratory findings included elevated sedimentation rates,
mia, and sideropenia attributed to the regional enteritis.
um α_2-globulin levels were elevated, while γ-globulin levels
ained unchanged. Antistreptolysin titers and tests for LE
s and antigammaglobulin consumption were negative. One
ient had a very positive Waaler-Rose test. Even after many
rs of joint involvement, X-rays showed no joint narrowing,
erosion of the joint surface, and no severe osteoporosis.
gical removal of the affected part of the intestine produced
issions in 2 cases, but the patients have not been followed
enough to draw any definite conclusions about the value
his procedure. These findings are compared with those in
rative colitis and rheumatoid spondylitis.

ABSORPTION STUDIES IN REGIONAL ENTEROCOLITIS (Mb. CROHN). *(E.)* Dotevall, G.
lgren Hosp., U. Göteborg, Sweden) and N. G. Kock. *Scand*
stroent 3(3):293-298, 1968.

absorption of carbohydrate, vitamin B_{12} and fat was studied
0 patients (17 men and 13 women, 10-70 yr old) with re-
al enteritis (Crohn's disease). The levels of vitamin B_{12}
folic acid in serum and folic acid in whole blood were also
rmined. The absorption of D-xylose was normal in 23
nts (77%), abnormal in 1 (3%), with borderline values in
0%). The Schilling test was normal in 9 patients (31%),
rmal in 9 (31%), and borderline in 11 (38%). Fat absorp-
was normal in 10 patients (40%), abnormal in 8 (32%) and
erline in 7 (28%). There was a high incidence of low serum
acid levels in patients with normal values in whole blood, which was attributed to decreased appetite and chronic inflammation and not to malabsorption. A high incidence of low serum vitamin B_{12} was noted in the 10 patients who had previous small bowel resections (5 abnormal, 4 borderline). Although steatorrhea was only seen in patients with jejunal changes, malabsorption of fat was also seen in patients without morphological changes in the jejunum and upper ileum.

521 **REGIONAL ENTERITIS PRESENTING AS HYPOPROTEINEMIA WITHOUT INTESTINAL SYMPTOMS. [CASE REPORT]** *(E.)* Cobb, T. C. (Brooke Army Med. Ctr., Fort Sam Houston, Tex.). *JAMA* 207(7): 1351-1352, 1969.

522 **REGIONAL ENTERITIS: A CRITICAL APPRAISAL.** *(E.)* Herwick, P. Q. (George Washington U., Washington, D. C.) and J. W. Canter. *Southern Med J* 61(10):1034-1038, 1968.

523 **CROHN'S DISEASE IN THE CAPE: A FOLLOW-UP STUDY OF 24 CASES AND A REVIEW OF THE DIAGNOSIS AND MANAGEMENT.** *(E.)* Brom, B. (Groote Schuur Hosp., Cape Town, South Africa), S. Bank, I. N. Marks, G. O. Barbezat and B. Raynham. *S Afr Med J* 42(40): 1099-1107, 1968.

524 **DUODENAL ILEUS DUE TO DUODENOJEJUNAL LOCALIZATION OF CROHN'S DISEASE.** *(It.)* Fiorelli, E. (Cardinal Ascalesi Hosp., Naples, Italy) and A. R. Lombardi. *Riforma Med* 82(45):1246-1254, 1968.

525 **CROHN'S DISEASE OF THE STOMACH AND TERMINAL ILEUM.** *(Fr.)* Van der Hoeden, R., R. Heimann, C. Gins and E. Henrotin. *Arch Franc Mal Appar Dig* 57(8/9):715-724, 1968.

See also: 224,585,629

Malabsorption

526 **NEOPLASIA AND THE COELIAC SYNDROME IN ADULTS.** *(E.)* Brunt, P. W. (Western Gen. Hosp., Edinburgh, Scotland), W. Sircus and N. Maclean. *Lancet* 1(7587):180-184, 1969.

Cases of malignant small bowel or mesenteric lymph node neoplasia admitted during 1958-67 were reexamined with a view to determining on what basis neoplasia might be suspected in cases of malabsorption appearing in adults. There was no evidence of malabsorption among 20 patients with small intestinal carcinomas, leiomyosarcomas or malignant carcinoid tumors. However, unequivocal evidence of malabsorption was found in 13 of 15 cases of abdominal lymphoma. Although there were alterations in villus morphology in all but 1 case, there was no correlation between villus change and the degree of malabsorption, extent and cell type of the tumor, or the duration of symptoms before neoplasm diagnosis. Pain, profound weight loss and anorexia were the primary symptoms. Lymphoma should be suspected when the onset of celiac syndrome occurs in middle age. The initial investigations should include an exploratory laparotomy and a careful follow-up for several years.

527 **JEJUNAL MUCOSA IN MALABSORPTION SYNDROME.** *(E.)* Mallik, K. K. (Inst. Postgrad. Med. Educ. Res., Calcutta, India), N. C. Pal and C. R. Das. *Bull Inst Postgrad Med Educ Res* 10(2):49-55, 1968.

Oral jejunal biopsies were taken by Crosby capsule in 39 patients (25 men and 14 women, 17-57 yr old), including 25 with malabsorption syndromes due to tropical sprue (16), postgastrojejunostomy steatorrhoea (4), intestinal tuberculosis (3) and giardiasis (2), 4 with diabetes mellitus, and 10 normal controls; 18 of the 25 patients with malabsorption also had hypochlorhydria. A normal jejunal mucosa was found in 1 case of tropical sprue, 1 case of diabetes, and 8 controls, while 14 patients with malabsorption (plus 1 diabetic and 1 control) had only mild mucosal abnormalities. Marked changes in the jejunal mucosa, i.e., a decrease in villous height to below 250 μ, a crypt-villi ratio of 1:1.5 or greater, and heavy cellular infiltration with poor mucus secreting activity of the glands, were seen in 10 of the 25 patients with malabsorption and 2 diabetics; such changes are strongly suggestive of tropical sprue. Improvement in the histological picture (increase in villous height and decrease in infiltration) was noted after treatment with folic acid in 3 cases studied. None of the cases had any complications due to jejunal biopsy.

528 **INTESTINAL DISACCHARIDASE ACTIVITY IN CELIAC SPRUE (GLUTEN-SENSITIVE ENTEROPATHY).** *(E.)* Welsh, J. D. (U. Oklahoma Med. Ctr., Oklahoma City), O. M. Zschiesche, J. Anderson and A. Walker. *Arch Intern Med* 123(1):33-38, 1969.

Enzymatic and histological studies of 37 small intestinal biopsy specimens from 22 patients with celiac disease (8 men and 13 women, 27-68 yr old, and one 7-yr-old child) revealed that mean tissue disaccharidase and alkaline phosphatase activities were inversely proportional to the severity of mucosal lesions. In mild cases, all assayed enzymes were found to be normal except lactase, which was low in 25%. When comparing paired specimens from adjacent areas in the region of the duodenojejunal junction, it was observed that the specimens exhibited similar morphological changes in 70% of the pairs; lactase activity was similar in all pairs, while the activity of other enzymes was similar in 74-86% of the pairs. Fair adherence to a gluten-free diet led to clinical improvement, but mild histological changes and a complete return of enzyme activity to normal occurred only in those patients adhering strictly to the dietary regimen.

529 **SERUM-BILE-ACIDS IN THE STAGNANT-LOOP SYNDROME.** *(E.)* Lewis, B. (Royal Postgrad. Med. Sch., London, England), D. Panveliwalla, S. Tabaqchali and I. D. P. Wootton. *Lancet* 1(7588):219-220, 1969.

Individual serum bile acids were measured in 5 patients with the stagnant-loop syndrome and 3 patients with extensive resection of the small intestine in order to investigate bile acid metabolism in patients with intestinal malabsorption. The 8 patients (4 males and 4 females) ranged in age from 34 to 84 yr. The total bile acid concentration was strikingly elevated, ranging from 13 to 52 μmoles/liter in the stagnant loop syndrome and from 8.6 to 15.2 μmoles/liter following intestinal resection, compared to 2.2-4.2 μmoles/liter in 12 normal controls. This increase was almost entirely due to the presence of free bile acids (cholic acid, chenodeoxycholic acid, and the secondary bile acid deoxycholic acid). While there were no free bile acids in control serum, in the patients the concentration of free bile acids exceeded that of conjugated bile acids, which were normal or only slightly elevated. However, the pattern of conjugation was abnormal, in that taurine conjugate were not detectable in 5 of the 8 patients. In one case studie there were high levels of free bile acids and no taurine conjuga prior to the oral administration of lincomycin (1.5 g/day in divided doses), but after 7 days of antibiotic treatment the co centration of free bile acids fell sharply from 9.6 to 0.67 μmoles/liter and the proportion of taurine conjugates rose.

530 **BACTERIAL CONTAMINATION OF THE UPP SMALL BOWEL IN TROPICAL SPRUE.** *(E.)* Gorbach, S. L. (Calcutta Sch. Trop. Med., India), J. G. Banwe R. Mitra, B. D. Chatterjee, B. Jacobs and D. N. Guha Mazumd *Lancet* 1(7584):74-77, 1969.

The methods of intestinal intubation and microbial analysis previously used to investigate the stagnant loop syndrome we used to study tropical sprue in 6 patients (5 males and 1 fem with impaired D-xylose and vitamin B_{12} absorption. These patients ranged in age from 24 to 48 yr and included 5 Beng patients and 1 American student; 5 of the 6 had steatorrhea. Eight Bengali males served as controls. All 6 patients with tropical sprue had an abnormal bacterial flora in the small intestine, the most consistent finding being an alteration in the location and increased concentration of coliforms. Two pati had coliforms in the stomach and 3 had coliforms in the upp and mid jejunum, while no coliforms could be isolated from the jejunum in controls. Concentrations of gram-positive mi organisms were also generally increased in sprue patients com pared with controls. There was some correlation between m absorption and abnormalities in the microflora; thus vitamin absorption was lowest in 2 patients who had coliforms in th stomach and upper jejunum, and short-term antibiotic therap produced marked improvement in absorption in 2 cases. Ca

ports of these 2 patients demonstrated a direct relation be-
een defects in vitamin B_{12} and lipid absorption and an ab-
rmal microbial flora.

1 **ADULT CELIAC DISEASE.** *(E.)* Cooke, W. T. (Gen. Hosp., Birmingham, England). Pp. 299-
8 in *Progress in Gastroenterology.* Vol. 1. Glass, G. B. J.,
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2 **ELECTRON MICROSCOPY OF INTESTINAL FAT ABSORPTION UNDER NORMAL CON-
TIONS AND IN MALABSORPTIVE STATES.** *(E.)* Dob-
s, W. O. III (Duke U. Med. Ctr., Durham, N.C.). Pp. 261-
5 in *Progress in Gastroenterology.* Vol. 1. Glass, G. B. J.,
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**WHIPPLE'S DISEASE ASSOCIATED WITH A COMMON MESENTERY: STUDY UNDER THE
HT AND ELECTRON MICROSCOPES.** *(Fr.)* Heully, F.,
Gaucher, F. Penin, M. Bas, J. Fays, Grignon and G. Rauber.
h Franc Mal Appar Dig 57(8/9):699-714, 1968.

**SEROLOGICAL DIAGNOSIS OF IDIOPATHIC ADDISON'S DISEASE IN PATIENTS ON PRO-
GED PREDNISOLONE THERAPY FOR STEATOR-
EA.** *(E.)* Goudie, R. B. (Western Infirm, Glasgow,
and), I. T. Boyle, D. A. Stuart-Smith and A. Ferguson.
et 1(7587):186- 188, 1969.

PRIMARY LYMPHADENOPATHY COMPLICATING IDIOPATHIC STEATORRHOEA. *(E.)*
ehead, R. (Radcliffe Infirm., Oxford, England). *Gut* 9(5):
575, 1968.

DISACCHARIDASE DEFICIENCY. *(E.)* Peternel, W. W. (U. Pittsburgh, Pa.). *Med Clin N Amer*
):1355-1365, 1968.

MALABSORPTION. *(E.)* Finkelstein, J. D. (George Washington U., Washington, D. C.). *Med*
N Amer 52(6):1339-1354, 1968.

**INTESTINAL ABSORPTION OF DISACCHARIDES AND THE PROBLEM OF LACTOSE INTOLER-
E IN ADULTS.** *(Fr.)* Gouin, B. *Vie Med (Spec)* 49:
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MACROGLOBULINAEMIA AND STEATORRHOEA. *(E.)* Bradley, J. (Dept. Med., U.
ngham, Ala.), C. F. Hawkins, D. S. Rowe and D. R.
orth. *Gut* 9(5):564-568, 1968.

DYSGAMMAGLOBULINAEMIA IN TROPICAL SPRUE. *(E.)* Jarnum, S. (Tata Mem. Hosp., Parel,
ay, India), K. N. Jeejeebhoy and B. Singh. *Brit Med J*
3):416-418, 1968.

WHIPPLE'S DISEASE: EARLY DIAGNOSIS. *(E.)* Bornstein, R., A. Theologides and B. J.
dy. *Minn Med* 51(10):1345-1349, 1968.

INTESTINAL ABSORPTION OF RADIOACTIVE CALCIUM IN PATIENTS WITH SARCOIDOSIS. *(It.)* Cantalamessa, L. (Inst. Clin. Med. Gen. Ther., U. Milan, Italy), E. Cassi and U. Visca. *Haematologica* 53(6):451-463, 1968.

543 **LONG-TERM RESULTS OF THERAPY IN WHIPPLE'S DISEASE: REPORT OF FOUR PERSONAL CASES.** *(Fr.)* Julien, C. (St. Antoine Hosp., Paris, France), J. Plessier, J. Etévé and J. Caroli. *Rev Medicochir Mal Foie* 43(5):145-174, 1968.

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See also: 36,195,220,258,262,286,499,657

LARGE INTESTINE

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LITIS OF THE SIGMOID FLEXURE.** *(E.)*
oore, H. D. (Exeter, England). *Dis Colon Rectum* 12(1):
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n unselected series of 15 patients with acute diverticulitis
men and 7 women, average age 63 yr; including 5 patients
ith generalized peritonitis, 6 with peritonitis localized to
abdominal quadrant, and 4 with acute intestinal obstruction)
ere treated by radical surgery—mobilization of the colon to
teriorize and remove the involved portion of bowel after
osure of the abdominal wall around the colon. Pus was
eared from the peritoneal cavity with saline washings in those
tients with peritonitis. Antibiotics were used in all cases.
ere were no deaths. Subsequent closure of the colostomy
s uneventful in all cases. In the 11 patients with peritonitis
ere were 3 postoperative complications ('burst abdomen',
perficial wound infection, phlebitis); the average hospital stay
s 19 days. In the 4 patients with acute intestinal obstruc-
n, there were 2 postoperative complications (venous thromb-
s, pelvic abscess—resolved spontaneously); the average hos-
al stay was 26 days. Radical surgery is concluded to be a
er method of treating acute diverticulitis than proximal
lostomy.

2 **CLINICAL AND BIOCHEMICAL PARALLELS
IN CHRONIC COLITIS AND CHRONIC PAN-
EATITIS.** *(Rus.)* Iukhvidova, Zh. M. (Sci.-Res. Lab.
ctol., Min. Health RSFSR, Moscow, USSR), M. Kh. Levitan,
I. Sokolov, A. V. Konsistorum and S. M. Bolotin. *Sovet
d* 31(10):118-122, 1968.

nical and laboratory studies were run on 96 patients with
onic colitis, aged 16-68 yr, and 50 patients with chronic
creatitis, aged 35-65 yr. Enzyme activities were generally
hin normal limits in 20 patients with nonspecific ulcerative
itis except for the amylase activity which was elevated in
Changes in amylase, lipase, and trypsin activities were
st pronounced in colitis patients with symptoms of pancreatic
olvement. Except for trypsin activities, which were reduced
0 cases, duodenal enzyme activities were generally within
mal limits in the majority of 15 patients with chronic pan-
titis. Duodenal enzyme activities varied widely in the first
tions taken after duodenal stimulation. Trypsin activities
e first reduced, then returned to their normal levels. Lipase
amylase activities were reduced for the entire period of the
. Fecal enzyme activities in ulcerative colitis patients were
ated in those with extensive involvement of the colon and
e even higher in those with involvement of the small in-
ine. Enzyme activities were generally within normal limits
ilder cases. Blood and urine diastase activities did not
e in patients with chronic pancreatitis, with or without
lecystitis, and clinical symptoms of colitis. Glucose toler-
curves were abnormal in all patients with chronic pan-
titis. Serum protein fractions were abnormal in all patients
pancreatitis and ulcerative colitis. Those with acute or
rrent conditions had increased α_1- and α_2-globulin levels,
e those with chronic conditions had increased γ-globulins
reduced albumins.

563 **AN EXPERIMENTAL COMPARISON OF INVERSION AND EVERSION COLONIC ANASTOMOSES.** *(E.)* McAdams, A. J. (Pittsburgh, Pa.), G. Meikle and R. Medina. *Dis Colon Rectum* 12(1):1-6, 1969.

A series of 133 colon transections and anastomoses was performed in 90 dogs in order to compare the "standard" 2-layer inversion anastomosis (continuous chromic catgut through-and-through suture and seromuscular silk Halsted stitches) with the single-layer eversion anastomosis (interrupted silk stitches). The inverting anastomosis required more time (4.9 min) than the single-layer eversion. No significant difference in the degree of inflammation after inversions and eversions was observed on microscopic examination. The degree of adhesion formation adjacent to the anastomoses was not appreciably different in the 2 types. Healing by restoration of mucosal continuity and fibroplasia appeared earlier in inversions than in eversions. Reduction of the lumen of the bowel was greater after inversion, especially in the early postoperative period. Resistance to disruption by distension was greater in inversions than in eversions. However, after a lapse of 9 days, eversions had adequate resistance to disruption. Local complications were less common after inversions than after eversions and the mortality rate was appreciably lower after the former than after the latter. Adequate cleansing of the colon appeared to exert a favorable influence on inversion repair. Although the standard double-layer inversion technique of colonic anastomosis caused more stenosis, it resisted disruption better, caused fewer local complications and had a lower mortality rate than the single-layer eversion anastomosis.

564 **SPECIFIC ACTIVITY OF HYDROXYPROLINE-TRITIUM IN THE HEALING COLON.** *(E.)* Cronin, K. (U. Oregon Med. Sch., Portland), D. S. Jackson and J. E. Dunphy. *Surg Gynec Obstet* 126(4):1061-1065, 1968.

In the first of 2 experiments to determine the sequence of collagen breakdown and synthesis above, below, and at the site of a healing colonic anastomosis, female Sprague-Dawley rats (210-250 g) were divided into 3 groups of 24 rats each. In each group, 12 rats had an anastomosis in the lower part of the left colon and 12 were kept as controls. Rats received proline-^{3}H (50 μC i.p.) 24 hr before sacrifice (3, 7, and 10 days after operation), and specific activities of hydroxyproline-^{3}H were determined in colonic sections above, below, and at the anastomosis. At 3 days, a high rate of collagen synthesis was present at the anastomotic site (as compared to controls), as well as above and below the anastomosis. At 7 days, a sharp drop in the rate of synthesis was noted at all sites, but remained higher than in the controls except at a point well above the anastomosis (below control values). After 10 days, the rate of synthesis above and below the anastomosis was less than control values, but remained above control values at the anastomosis. In the second experiment, the protocol was identical to the first, except that proline-^{3}H was given in 4 divided doses over 48 hr, 1 week before operation. The specific activity of hydroxyproline-^{3}H was much higher in the rats with the anastomoses than in controls. The most likely explanation for this finding is that the collagen which is destroyed while the anastomosis heals is old collagen, present in the intestine before the isotope was given. Specific activities at 7 and 10 days revealed a return toward normal. These results suggest that for at least the first 5 days of healing, destruction and synthesis of collagen occur simultaneously, and only when the breakdown ceases about the 5th day does the total collagen content return to normal.

565 **HISTOCHEMICAL ASPECTS OF MELANOSIS OF THE COLON: REPORT OF 4 CASES.** *(Fr.)* Kerisit, J. (Fac. Med., Strasbourg, France) and M. Weill-Bousson. *Ann Anat Path (Paris)* 13(3):335-345, 1968.

A histochemical study was made of pigment found in sections of colon taken from patients with 1) cancer of the transverse colon, 2) rectosigmoid endometriosis, 3) sigmoid diverticulitis, and 4) cecal melanosis, without associated colonic lesions, found fortuitously at autopsy in a patient who died of heart failure. In 2 of 3 cases lymph glands taken near pigmented regions contained excess ganglionic pigment. Pigments were always found in the mucosal chorion, either inside or outside of the histiocytes. Pigmentation was accompanied by an inflammatory infiltrate which included lymphocytes, some plasmocytes, eosinophilic polynuclear leukocytes, and mast cells. A study of the physical and histochemical properties of this pigment showed that there were 2 different varieties, one of which is probably a lipofuscin and the other a melanin. Contrary to the findings of Cabanne and Couderc, most of the pigments in associated ganglia reduced silver. These findings are compared with those in the Dubin-Johnson syndrome.

566 **IMMUNOLOGICAL STUDIES OF CANCER-SPECIFIC RECTAL ANTIGENS PURIFIED WITH FLUOROCARBON.** *(Jap.)* Matsumoto, D. (Fac. Med., Hirosaki U., Japan). *Hirosaki Med J* 20(1):135-151, 1968.

The presence of specific antigens in rectal cancer was studied by means of the Ouchterlony gel-diffusion technique using rectal cancer specimens and rabbit antisera prepared against fluorocarbon-purified antigens from normal and malignant rectal tissue. It was shown that the cancerous and normal rectal tissue antigens exhibited several common precipitin bands. Anticancer serum adsorbed with normal tissue antigens still yielded one precipitin band with the cancer antigen. These results suggest that there may be specific antigens in rectal cancer tissue.

567 **CONTROL BY ELECTRONIC STIMULATOR OF INCONTINENCE AFTER OPERATION FOR ANORECTAL AGENESIS.** *(E.)* Dickson, J. A. S. (Hosp. Sick Child., London, England) and H. H. Nixon. *J Pediat Surg* 3(6):696-701, 1968.

In 10 children (9 boys and 1 girl) with fecal incontinence and constant severe soiling after gracilis sling procedures as part of the treatment for anorectal agenesis (8), anal stenosis (1), and spina bifida (1), electronic muscle stimulators were implanted in the abdominal wall with electrodes sutured into the motor point of the gracilis in order to keep the sling constantly taut. The stimulators produced a unidirectional square wave of 1 msec duration, 5 volts amplitude, at a rate of 20/sec. There were 2 technical failures: 1 patient developed sepsis and required removal of the stimulator, while in another patient the sling became paralyzed after resolution of a postoperative hematoma. The remaining 8 have functional slings; 4 are definitely improved, 2 are too recent to assess, 1 refuses to try, and 1 has had unexplained diarrhea. The only significant complication was sepsis, which occurred in 3 patients. These early results show that, using the electrically-stimulated gracilis sling, an artificial sphincter with tone can be constructed for the anal canal which will give adequate social continence by day, but will not control either fluid faces or mucus staining from exposed mucosa.

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577 **PREVENTING RECURRENCES AND METASTASES FOLLOWING OPERATIONS FOR CANCER OF THE COLON AND RECTUM.** *(Rus.)* Kholdin, S. (N. N. Petrov Inst. Oncol., Min. Health USSR, Leningrad). *Khirurgiia (Moskva)* 44(8):132-135, 1968.

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601 **PERITONITIS DUE TO PERFORATION OF A CARCINOID TUMOR OF THE SIGMOID.** *(It.)* Belloni, G. (BUsto Arsizio Distr. Hosp., Italy), F. d'Errico and P. Lampertico. *Minerva Chir* 23(19):1042-1045, 1968.

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U., Indianapolis) and W. E. Segar. *Amer J Dis Child* 115(6): 714-718, 1968.

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622 CARCINOID SYNDROME AND CARCINOID TUMORS OF THE RECTUM. *(E.)* Saegesser, F. (U. Hosp., Lausanne, Switzerland) and M. Gross. *Amer J Proctol* 20(1):27-32, 1969.

623 CARCINOMA ASSOCIATED WITH ANAL FISTULA. *(E.)* Yoh, S. (Kyoto U. Med. Sch., Japan), M. Yamane and K. Ishigami. *Arch Jap Chir* 37(6):902-905, 1968.

624 CANCER OF THE RECTUM (REVIEW BASED ON A STUDY OF 180 CASES). *(E.)* Reddy, D. B. (Guntur Med. Coll., India), K. R. R. M. Rao and D. Sarada. *Indian J Cancer* 5(3):274-281, 1968.

625 THE COLON AND DISEASE. [EDITORIAL] *(E.)* Kasliwal, R. M. (Kasliwal House, Chitranjan Marg, Jaipur, India). *Amer J Proctol* 19(6):391-392, 1968.

626 HIRSCHSPRUNG'S DISEASE IN THE NEONAT PRESENTING AS CECAL PERFORATION. *(E.* Ajayi, O. O. A. (U. Coll. Hosp., Ibadan, Nigeria), T. F. Solank O. Seriki and S. P. Bohrer. *Pediatrics* 43(1):102-106, 1969.

See also: 207,224,225,238,252,293,299,426,445,523,683,690,824

627 **TOXIC MEGACOLON.** *(E.)* Thomford, N. R.
(Dept. Surg., Ohio State U. Coll. Med., Columbus),
I. J. Rybak and W. G. Pace. *Surg Gynec Obstet* 128(1):21-26,
1969.

Dut of 623 patients with ulcerative colitis admitted to the
Dhio State University Hospitals, from Jan. 1953 to Dec. 1967,
23 (3.7%) had a fulminating episode complicated by marked
listention of all or a portion of the colon (toxic megacolon).
The complication occurred less than 1 yr after the onset of
ilcerative colitis in 15 patients. Abdominal distension was pro-
iounced in 9 patients, moderate in 6, mild in 5, and absent in
. Roentgenograms showed dilation of the transverse colon
n all patients, with dilation of the entire colon in 14. Of the
patients managed by medical measures alone (steroids, anti-
iotics, whole blood), 1 died. Surgery was required in 19 cases,
of which (26.3%) resulted in death. The results of operations
erformed before perforation into the peritoneal cavity suggest
hat surgical management for toxic megacolon, often required,
relatively safe.

28 **STEROID THERAPY AND ITS EFFECT ON
THE FUNCTIONAL STATUS OF THE
ITUITARY-ADRENAL SYSTEM IN NONSPECIFIC ULCERA-
IVE COLITIS.** *(Rus.)* Gerasimov, V. K. (Leningrad Med. Inst.
anit. Hyg., Acad. Med. Sci. USSR). *Ter Arkh* 40(10):98-101,
968.

rinary 17-hydroxycorticosteroids were determined before and
fter and every 5-8 days during steroid treatment of 72 patients
ith ulcerative colitis. Dosages were 25-125 mg/day hydrocor-
sone, 15-25 mg/day prednisolone or 2.25-4.5 mg/day dexa-
ethasone p.o. Therapy was continued for 1-2 months until
atients showed clinical improvement and was discontinued
y progressively decreasing the dosage. Steroid therapy was
ombined with administration of vitamin B complex, ascorbic
cid, tranquilizers, and a well-balanced diet. Fifty-one of these
2 patients benefited from steroid therapy, and a clear-cut
inical effect was seen in 20 cases; hypoadrenocorticism was
resent in 15 of these 20 patients. Therapy had little or no
fect in the remaining 18 cases; pituitary-adrenal function was
ormal or elevated in 11 of these 18 and moderately reduced
only 7. These findings suggest that steroid therapy for ul-
rative colitis is most effective in patients with reduced pituitary-
lrenal function. Steroid dosages should be progressively re-
iced and therapy discontinued when urinary 17-hydroxycorti-
osteroid excretion starts to decrease during successful therapy.

29 **NEPHROLITHIASIS IN INFLAMMATORY
BOWEL DISEASE.** *(E.)* Gelzayd, E. A. (Dept.
ed., U. Chicago, Ill.), R. I. Breuer and J. B. Kirsner. *Amer
Dig Dis* 13(12):1027-1034, 1968.

review of 885 patients with ulcerative colitis (677), ileo-
litis (107) or regional enteritis (101) who were admitted
om 1959 to 1965 revealed 64 patients (7.2%) with renal
ones. Of these, 43 had ulcerative colitis, 10 had ileocolitis
d 11 had regional enteritis. The average duration of the
wel disease was 10 yr in 35 men and 8 women (average age
yr) with ulcerative colitis, 8.2 yr in 5 men and 5 women
verage age 19 yr) with ileocolitis, and 11.6 yr in 9 men and
2 women (average age 24 yr) with regional enteritis. Eight patients presented X-ray evidence of other renal abnormalities. At least 23 patients (36%) had other conditions associated with the development of stones, and 12 patients (19%) had evidence of prior urinary tract infection. Calcium stones were identified in 46 patients, uric acid stones in 12 and in 6 patients the stones could not be classified. Forty-seven patients (73%) had received corticosteroid therapy prior to the diagnosis of the stones, while 29 (45%) had previous intestinal surgery. Serum uric acid levels exceeding 6.5 mg/100 ml were found in 8 of 31 patients tested. A persistently acid urine (pH 5.5 or less) was present in 45 of 58 patients (78%). Such persistent acidity, as well as the increased concentration and excretion of urinary crystalloids and intestinal surgery may be significant factors in the pathogenesis of renal stones in inflammatory bowel disease.

630 **CELL-MEDIATED IMMUNE REACTION TO COLON ALTERED BY BACTERIA.** *(E.)* Fink, S. (VA Hosp., Hines, Ill.) and R. F. Mais. *Gut* 9(6):629-632, 1968.

Ten normal subjects, 7 patients with ulcerative colitis and 1 patient with sarcoidosis (all males) were tested for skin sensitivity to autologous colon, colon treated with *Escherichia coli,* and *E. coli* alone. All preparations were chemically sterilized with Betaprone. None of the subjects reacted to the intradermal skin tests performed with autologous colon alone, whereas a positive reaction, which was grossly and histologically of the cell-mediated immune type (maximal in 24-48 hr), followed in every case in which live *E. coli* (0 14, 0119, 0119:B14) had been incubated with colon tissue *in vitro*. When the antigen was injected into the skin through a Millipore filter, no reactions occurred, indicating that the antigenic product is larger than 0.22 μ. Colon tissue dialyzed against bacterial suspensions of *E. coli* caused a positive skin reaction in 8 of 10 subjects tested. This demonstrates that the bacterial product is capable of passing through a membrane of 48 Å pore size. That Betaprone did not alter colon antigenicity was shown by experiments in which autologous colon not treated with Betaprone also failed to produce a skin reaction. Both normal and ulcerative colitis patients reacted similarly in these tests; however, the implications of the results in the pathogenesis of ulcerative colitis are discussed. The lack of positive response in the patient with impaired delayed sensitivity due to sarcoidosis supports the interpretation that the skin reaction caused by colon treated with *E. coli* filtrates was a delayed-type of sensitivity.

631 **IMMUNE MECHANISMS AND ULCERATIVE COLITIS.** *(E.)* Watson, D. W. (U. California Sch. Med., Davis) and R. J. Bolt. Pp. 391-411 in *Progress in Gastroenterology.* Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton . 1968. 520 pp.

632 **A CASE OF ULCERATIVE COLITIS PRESENTING WITH ACUTE PERFORATIVE PERITONITIS AS THE INITIAL SYMPTOM.** *(Jap.)* Yasutomi, H. (Nihon U. Med. Sch., Tokyo, Japan). *Nippon Ika Daig Z* 35(3):221-227, 1968.

633 **ULCERATIVE COLITIS IN CHILDREN.** *(E.)* Hanley, P. H. (Ochsner Clinic, New Orleans, La.) and J. E. Ray. *South Med J* 61(11):1231-1233, 1968.

634 **THE EFFECT OF SYSTEMIC STEROIDS ON ILEORECTAL ANASTOMOSIS IN ULCERATIVE COLITIS.** *(E.)* Price, L. A. (Gordon Hosp., London, England). *Brit J Surg* 55(11):839-840, 1968.

635 **CORRELATION BETWEEN PATHOLOGIC AND RADIOLOGIC CHARACTERISTICS OF ULCERATIVE COLITIS.** *(E.)* Chapman, M. (St. Mark's Hosp., London, England). *Dis Colon Rectum* 12(1):58, 1969.

636 **ADENOCARCINOMA OF THE ILEOSTOMY OCCURRING AFTER COLECTOMY FOR ULCERATIVE COLITIS: REPORT OF A CASE.** *(E.)* Sigler, L. (Rochester Gen. Hosp., N. Y.) and F. L. Jedd. *Dis Colon Rectum* 12(1):45-48, 1969.

637 **DOES THE FREQUENCY OF CANCERATION IN ULCERATIVE COLITIS JUSTIFY A PROPHYLACTIC PROCTOCOLECTOMY?** *(E)* Saegesser, F. (Fac. Med., Lausanne, Switzerland) and D. Waridel. *Amer J Proctol* 20(1):33-44, 1969.

638 **COLITIS AND ARTHRITIS.** *(E.)* Ratnu, K. S. (S. M. S. Med. Coll., Jaipur, India), R. M. Kasliwal, V. S. Baldwa and J. P. Sethi. *Amer J Proctol* 19(6):401-404, 1968.

See also: 203,224

PANCREAS

39

DIGESTIVE FUNCTION AFTER RADICAL PANCREATICODUODENECTOMY. *(E.)* Fish,
. C. (U. Texas Med. Branch, Galveston), L. B. Smith and R. D.
Villiams. *Amer J Surg* 117(1):40-45, 1969.

'ancreatic function was evaluated in 6 patients 20-84 months
fter pancreaticoduodenectomy for periampullary carcinoma.
ll patients manifested some degree of pancreatic insufficiency,
nd 3 were unable to regain their weight or resume their pre-
ious occupations. All patients had an increased number of
tools daily (3-12) and were receiving a small amount of pan-
reatic enzyme supplementation. Five of the 6 patients had
bnormally high amounts of fecal fat and 3 had an elevated
ecal nitrogen excretion. Diabetic glucose tolerance curves
ere found in all 6, but no treatment other than diet was re-
uired. Serum albumin, total exchangeable albumin, and al-
umin half-life were decreased in all patients, and liver biopsy
evealed fatty infiltration in 3 of 4. Subjective and objective
nprovement was obtained by instituting adequate doses of
ral pancreatic enzymes. In 9 dogs, elevated fecal fat and
itrogen as well as diabetic glucose tolerance curves were found
ter resection and implantation of the distal pancreas. Pan-
eatic atrophy secondary to pancreatic duct stricture at the
te of implantation was found at sacrifice. Obstruction of the
ncreatic duct followed by resection and implantation of a
ncreatic remnant did not influence subsequent results. The
ss of digestive enzymes secondary to stricture of the pan-
eatic duct, parenchymal atrophy, and functional insufficiency
ter implantation of the residual pancreatic stump into the
wel may be overcome by pancreatic enzyme supplementation
adequate dosage, with full rehabilitation of these patients.

0

**SWEAT COMPOSITION IN RELATION TO RATE OF SWEATING IN PATIENTS WITH CYSTIC
BROSIS OF THE PANCREAS.** *(E.)* Emrich, H. M. (Dept.
diat., U. Bern, Switzerland), E. Stoll, B. Friolet, J. P. Colombo,
Richterich and E. Rossi. *Pediat Res* 2(6):464-478, 1968.

a large number of control subjects and patients with cystic
rosis of the pancreas (CFP), single sweat droplets were col-
ted from a mineral oil-covered finger surface. The rate of
eat production was calculated and the concentration of
ctrolytes and metabolites, osmolarity, pH, and viscosity were
termined in undiluted pooled sweat. There was no significant
ference in the sweat rate/gland between control subjects and
tients with CFP. The concentration of Na$^+$ and Cl$^-$ rose and
t of K$^+$ and Ca^{++} fell with increasing sweat rates in both
ups. However, the K$^+$ concentration in patients with CFP
s frequently twice that in control subjects. The concentra-
ns of lactic acid and urea were high at low sweat rates and
reased hyperbolically with increasing rates, the values in CFP
ients being lower than those in controls. Creatinine decreased
h increasing sweat rates and was similar in the 2 groups, while
ilar in both groups. Osmolarity decreased with increasing
at rates in both groups, from 240 to 120 milliosmoles/liter
owed by a rise to 163 milliosmoles/liter in controls, but
higher in patients with CFP, beginning and ending at about
milliosmoles/liter. The pH became slightly alkaline with
reasing sweat rates in both groups. Viscosity was significantly
reased in CFP patients. The excretory pattern for metabolites
es against increased water reabsorption in the excretory duct,
while the Na$^+$ and Cl$^-$ curves favor an isotonic precursor fluid. It appears that Na$^+$ reabsorption in the excretory duct is defective in cystic fibrosis.

641

SURGICAL EXPERIENCE WITH PANCREATIC PSEUDOCYSTS. *(E.)* Rosenberg, I. K. (Dept. Surg., Wayne State U., Detroit, Mich.), J. A. Kahn and A. J. Walt. *Amer J Surg* 117(1):11-17, 1969.

Forty-six patients (39 men and 7 women, 16-61 yr old) with 53 pseudocysts of the pancreas were encountered among 2371 patients admitted with a diagnosis of pancreatitis over a 10-yr period. Etiological factors included alcohol in 39 cases, cholelithiasis in 7 and trauma in 4. Surgical treatment of 49 pseudocysts included external drainage, internal drainage into an adjacent organ, and pancreatic resection. While all methods of treatment had associated complications, internal drainage seemed the best technique; external drainage is best utilized as a temporary expedient in pseudocysts unsuitable for internal drainage. Where active or recent bleeding was present, resection of the pseudocyst and adjacent pancreas was considered desirable whenever technically feasible. The incidence of pancreatic ascites was 13%, indicating a higher frequency of this complication than had been previously thought. Although acute rupture of a pseudocyst is generally considered a lethal event, 4 patients suffered this complication and were successfully treated surgically. Follow-up showed a 15% rate of recurrence or development of a new pseudocyst.

642

NORETHANDROLONE IN CYSTIC FIBROSIS OF THE PANCREAS. *(E.)* Dooley, R. R. (UCLA Sch. Med., Los Angeles, Calif.), A. J. Moss, P. M. Wright and P. C. Hassakis. *J Pediat* 74(1):95-102, 1969.

Norethandrolone (0.6 mg/kg to a maximum of 10 mg daily for 6 weeks, then every other day for 6-40 months) was given to 28 patients (8 boys and 20 girls, 8 months-21.5 yr old) with advanced changes secondary to cystic fibrosis. Subjective improvement and immediate weight gain were noted in most patients; however, significant improvement in nutrition and pulmonary function was noted only in the preadolescent females. Eight of the children died during the study. Toxic effects ascribable to anabolic hormone therapy included impairment of liver function (3 cases), increase in bone age (4), edema (4) and uterine bleeding (3). The more severe course of this disease in the female may relate either to a low endogenous androgen secretion or an effect of gonadotropins on mucus viscosity which is blocked by this anabolic agent. Even in preadolescent females, anabolic steroids should be used only with caution and as a last resort.

643

CARCINOMA OF THE PANCREAS. *(E.)* Elias, E. G. (Roswell Park Mem. Inst., Buffalo, N. Y.). *Arch Surg* 98(2):138-140, 1969.

A retrospective study of necroscopy findings in 58 cases of primary pancreatic carcinoma was made to elicit the cause of the poor prognosis of this disease. The group included 44 men and 14 women, 31-84 yr old. Histologically, 53 cases were glandular carcinoma, varying from well-differentiated to anaplastic tumors, 3 cases showed a mixture of glandular and squamous cell carcinoma, and 2 cases showed glandular carcinoma with squamous metaplasia. In 46 cases, the gross extent of the disease equalled the histological extent; distant metastasis without regional lymph node involvement was seen in 12 of these (portal or systemic spread). In the other cases, the gross description differed from the histological extent. There was more tumor in the pancreas than appeared grossly, and tumor was scattered throughout the organ. In 17 cases the tumor had involved most if not all of the pancreas. Two case reports are presented that exemplify the deceptive gross appearance of the tumor at operation, with the extent of histologically evident carcinoma being greater than the gross appearance. The possibility of residual tumor tissue in the pancreatic remnant or in the retroperitoneal lymph nodes at surgery may be one of the reasons for low survival in resected cases.

644 **A CORRELATIVE STUDY OF PROVEN CARCINOMA OF THE PANCREAS IN 83 PATIENTS.** *(E.)* Ansari, A. (Tulane U. Sch. Med., New Orleans, La.) and G. E. Burch. *Amer J Gastroent* 50(6):456-475, 1968.

The incidence, clinical features, pathologic anatomy, clinicopathologic correlations, course, prognosis and treatment of pancreatic carcinoma are reviewed on the basis of 83 proven cases of carcinoma of the pancreas observed during the period 1960-66 at the VA Hospital in New Orleans. These cases represented 0.19% of 44,076 hospital admissions, 2.4% of 2,270 autopsies and 3.3% of 2,506 malignancies observed during the 6-yr period. Maximal incidence (41%) was between 60 and 70 yr of age. The 1:1 ratio of whites to Negroes reflected the racial distribution at the hospital. Sixty-two patients (75%) gave a history of chronic alcoholism for an average period of 10-15 yr, and only 14% of control patients at the hospital were chronic alcoholics. Pain was the most common presenting symptom (77%), while weight loss was found in 72.3%, jaundice in 48.2% and bowel irregularity in 39.8% on admission. Psychiatric manifestations were present in 2.4% of the series. On histologic examination, 85.5% of the tumors were well differentiated and mostly acinar. Laboratory data were rather heterogeneous and no laboratory confirmation of the diagnosis could be achieved. Upper gastrointestinal radiography revealed abnormalities in 45.2% of the cases. A correct clinical diagnosis was made in only 55.4% of the patients and later confirmed by biopsy or autopsy. The course of pancreatic carcinoma, regardless of site of origin, histology of the tumor or presence of metastasis, is one of rapid decline to death after onset of symptoms. Only 3.6% (3) of this series are presently surviving; 96.4% of the patients were dead within 10 months of the first hospital admission. Both radical and palliative surgery failed to modify the survival rate.

645 **TRAUMATIC TRANSECTION OF THE PANCREAS.** *(E.)* Jordan, G. L. Jr. (Baylor U. Coll. Med., Houston, Tex.), R. Overton and L. R. Werschky. *Southern Med J* 62(1):90-93, 1969.

Clinical features and methods of treatment of 7 patients (2 females and 5 males, 11-46 yr old) with complete transection of the pancreas due to blunt abdominal trauma are discussed. The need for serum amylase determinations in all patients having abdominal trauma is demonstrated particularly by one case in which severe pancreatic injury existed for a prolonged period with minimal abdominal findings. Based on experience in this series, delay in operative intervention endangers the patient's life and increases the incidence of complications. Surgery can be performed safely to reconstruct injuries of the pancreas; the choice of procedure depends on the state of the individual patient and the presence of intraabdominal disease. The techniques used in these cases included simple drainage, closure of both transected ends and drainage, excision of the distal portion, reconstruction with a Roux-en-Y loop, and reconstruction of the pancreatic duct over a plastic tube. With most transections, as long as 25-30% of the pancreas remains, diabetes should not occur. All patients survived, in spite of the high incidence of postoperative complications (pancreatic fistula in 3 cases, obstruction of the Roux-en-Y limb in 1, and intestinal obstruction and intraabdominal abscesses in 1). At the time of surgery, 1 patient whose treatment was seriously delayed had true traumatic pancreatitis. It is suggested that this term be reserved for cases of generalized pancreatic inflammation resulting from trauma.

646 **GASTROINTESTINAL HEMORRHAGE CAUSED BY ECTOPIC PANCREATIC TISSUE IN THE JEJUNUM.** *(Gr.)* Skamnakis, S. (Hippokrates Gen. Hosp., Salonika, Greece), S. Karamanolis, G. Khamourtziadis and L. Khristoforidis. *Galenos* 10(5/6):303-308, 1968.

647 **NECROTIZING PANNICULITIS IN A CASE OF ACINAR CARCINOMA OF THE PANCREAS.** *(Fr.)* Delage, J. (Fac. Med., Clermont-Ferrand, France), R. Lagarde and Y. Fonck-Cussac. *Arch Anat Path* 16(2):A134-A137, 1968.

648 **TRANSVERSE LACERATION OF THE PANCREAS.** *(Pol.)* Belowski, H. (L. Rydgier Munic. Hosp., Wroclaw, Poland) and W. Soltys. *Pol Przegl Chir* 40(10):1134-1136, 1968.

649 **SIMPLE TESTS OF VENTILATORY CAPACITY IN CHILDREN WITH CYSTIC FIBROSIS. PART I: CLINICAL AND RADIOLOGICAL FINDINGS IN 85 PATIENTS. PART II: THREE-YEAR FOLLOW-UP ON 50 PATIENTS.** *(E.)* Mearns, M. B. (Queen Elizabeth Hosp. Child., London, England). *Arch Dis Child* 43(231):528-539, 1968.

650 **A CASE OF ANNULAR PANCREAS WITH MEGADUODENUM.** *(It.)* Cané, A. and C. Natale. *Chir Gastroent* 2(3):349-359, 1968.

651 **SECTION OF THE PRINCIPAL PANCREATIC NERVE PLEXUS BY THE SUBMESOCOLIC ROUTE.** *(It.)* Benedetti Valentini, S. and I. Rossodivita. *Chir Gastroent* 2(3):360-365, 1968.

652 **CANCER OF THE PANCREAS.** *(Sw.)* Lundh, G. (Dept. Surg., Karolinska Inst., Stockholm, Sweden). *Lakartidningen* 65(47):4677-4686, 1968.

653 **IATROGENIC PERFORATION OF RETENTION CYST OF THE PANCREAS.** *(E.)* Rosato, F. E. (U. Pennsylvania Sch. Med., Philadelphia), J. Mobini, S. Eisman and E. M. Copeland. *Amer J Dig Dis* 14(1):35-41, 1969.

54 **AN APPROACH TO PANCREATIC OPERATIONS.** *(E.)* Elmslie, R. G. (Sch. Surg., U. New S. Wales, ustralia). *Aust New Zeal J Surg* 38(2):128-138, 1968.

55 **A CASE OF PANCREATIC CARCINOMA: POSSIBLE EFFECT OF THOROTRAST.** *(Por.)* e Oliveira, M. C. (Fac. Med., Porto, Portugal). *J Med (Porto)* 7(1348):575-580, 1968.

56 **JUDGMENT IN PALLIATION OF PANCREATIC CARCINOMA: WITH AN ASSIST BY THE OMPUTER.** *(E.)* Linn, B. S. (VA Hosp., Miami, Fla.) and . S. Goldstein. *Southern Med J* 62(1):116-118, 1969.

57 **EXPIRATORY PATTERN OF $^{14}CO_2$ AFTER FEEDING ^{14}C-LABELED FATS TO A PATIENT ITH TOTAL PANCREATECTOMY.** *(E.)* Blomstrand, R. Dept. Clin. Chem., Karolinska Inst., Stockholm, Sweden), G. Carlberger, L. Forsgren, G. Lundh and B. Norrbrink. *Acta Chir Scand* 134(8):667-669, 1968.

658 **THE BEHAVIOUR OF THE EXTRACELLULAR FLUID AND THE INTERCHANGEABLE CHLORIDE POOL IN MUCOVISCISOSIS.** *(E.)* Mussa, G. C. (U. Turin, Italy). *Panminerva Med* 10(10):405-407, 1968.

659 **REPORT OF TWO CASES OF PANCREATIC INJURY OCCURRING DURING ATHLETIC ACTIVITY.** *(Fr.)* Guillemin, G. (Hotel Dieu, Lyon, France), C. van der Hofstadt and G. Spay. *Lyon Med* 220(48):1409-1417, 1968.

660 **DIAGNOSIS AND TREATMENT OF PANCREATIC CANCER.** *(E.)* Hall, R. C. (Tulane U., New Orleans, La.) and E. T. Krementz. *Brit J Hosp Med* 1(2):168-178, 1968.

See also: 199,205,208,209,239,274,288,292

661 PANCREATIC DUCTAL MUCOSA AS A PROTECTIVE BARRIER IN THE PATHOGENESIS OF PANCREATITIS.

(E.) Konok, G. P. (McGill U. Surg. Clin., Montreal Gen. Hosp., P. Q., Canada) and A. G. Thompson. *Amer J Surg* 117(1):18-23, 1969.

The effects of normal bile, infected bile, trypsin and a bile salt-trypsin mixture on the pancreatic ductal mucosa, which normally acts as a protective barrier between the ductal contents and the pancreatic parenchyma, were investigated in anesthetized cats. Normal homologous feline gallbladder bile, crystalline trypsin (1.5 mg/ml saline), a 1:1 mixture of homologous gallbladder bile and enterokinase-activated pancreatic juice (previously incubated for 24 hr at 37C), a 1:1 mixture of ox bile (40 mg/ml) and crystalline trypsin (1.5 mg/ml saline), a suspension of *Escherichia coli* in isotonic saline (10^{11} organisms/ml), and homologous gallbladder bile infected with *E. coli* (10^{10} organisms/ml) and previously incubated for 24 hr at 37C were infused into the pancreatic ducts at a pressure of 15 cm H_2O in one of 2 ways: either into the proximal portion of an isolated duct in the direction of the duodenum (total volume 2.5 ml), or in a retrograde direction from the duodenum into a "closed" system (at a constant rate for 60 min). In both groups, the permeability of the ductal wall was evaluated 24 hr later by infusion of tubocurarine (30 mg in 3 ml saline), along with histochemical studies of pancreatic biopsy specimens. Significant increases in ductal mucosal permeability were produced only by infusions of bile incubated with pancreatic juice, bile salt-trypsin mixtures, or bile infected with *E. coli*, and only the latter produced parenchymal necrosis and an increase in tissue trypsin activity. When infused in the retrograde direction, the pancreatic ductal system accepted up to 4.5 ml of infected bile in 60 min, compared to only 0.1-0.7 ml for normal bile, *E. coli* suspensions, and trypsin solution, and 0.9-2.4 ml for bile salt-trypsin and bile-pancreatic juice mixtures. It is concluded that chemical compounds produced in bile by incubation with *E. coli* have a marked mucolytic and cytotoxic effect on the pancreatic ductal mucosa, and that reflux of infected bile may play a significant role in the pathogenesis of biliary pancreatitis in man.

662 GASTRIC SECRETION AND PEPTIC ULCER IN INFLAMMATORY DISEASES OF THE PANCREAS.

(Cz.) Šťastná, R. (Inst. Res. Hum. Nutrit., Prague, Czechoslovakia) and O. Bejblová. *Cesk Gastroent Vyz* 22(6):391-397, 1968.

X-ray examinations of the stomach and duodenum were made in: 1) 30 patients with a history of 1-3 attacks of acute pancreatitis, 2) 25 patients with chronic recurrent pancreatitis, and 3) 4 patients with chronic pancreatitis. Patients with acute pancreatitis were examined at least 6 weeks after an attack and those with chronic recurrent pancreatitis at least 6 weeks after an acute exacerbation. The secretin test showed that all patients with acute pancreatitis had normal exocrine pancreatic secretion while those with chronic recurrent pancreatitis and chronic pancreatitis had definitely abnormal values; those with chronic pancreatitis all had pancreatogenous malabsorption syndrome. Four stomach ulcers and 1 duodenal ulcer were found in 5 of the 30 patients with acute pancreatitis; 1 patient with chronic recurrent pancreatitis had a duodenal ulcer. None of the patients with chronic pancreatitis had peptic ulcers. Gastric acid secretion was normal in the patient with chronic recurrent pancreatitis and duodenal ulcer. Of the 4 patients with acute pancreatitis and stomach ulcers, 2 had hypochlorhydria and 2 hyperchlorhydria. Gastric acid secretion was reduced in the patient with acute pancreatitis and duodenal ulcer.

663 THE EFFECT OF THE INTESTINAL FACTOR ON THE MORTALITY OF EXPERIMENTAL PANCREATITIS.

(E.) Kiriakou, K. (Dept. Surg., U. Salonika, Greece), P. Andreadis, D. Toussis, B. Danielides and C. Tountas. *Surg Gynec Obstet* 128(2):340-347, 1969.

Acute pancreatitis was induced in 26 adult mongrel dogs in order to study its effect on the portal circulation and the role of the intestine in the production of the severe and often irreversible shock which can accompany pancreatitis. In all dogs, a mixture of blood and bile was injected under pressure into the pancreatic duct via a polyethylene catheter. All 10 dogs in the control group died between 90 min and 12 hr after the onset of pancreatitis. Portal pressure increased abruptly immediately after the onset of pancreatitis and remained elevated until the final stage. Histologic examination of the pancreas revealed diffuse hemorrhage with polymorphonuclear infiltration and necrotic acini. In another 12 dogs, the entire small intestine was removed immediately prior to the induction of pancreatitis. All dogs recovered, and all except 2 dogs stood up or sat within 12 hr. Four dogs died 12-52 hr after operation, 1 died 5 days later, and 1 died 8 days later. The portal pressure in this group slowly decreased, in contrast to control dogs. Histologic examination of the pancreas revealed hemorrhagic pancreatitis with progressive changes. Of the remaining 6 dogs in this group, 3 were killed on the 10th postoperative day. The pancreas appeared grossly normal; histologically, an increase in the connective tissue and lymphocytic infiltration was noted. Three dogs killed on the 30th postoperative day had apparently normal pancreases with only moderate connective tissue deposits between the lobules. In 4 other dogs, jejunal and ileal stomas were created in order to flush the small intestine with saline during the induction of pancreatitis. All dogs exhibited the same profound shock and survival time as the controls, and a similar increase in portal pressure. The pancreas exhibited changes similar to that in the controls. It is suggested that an enteric factor is responsible for the aggravation of pancreatic shock.

664 THE TREATMENT OF EXPERIMENTALLY INDUCED ACUTE PANCREATITIS.

(E.) Kune, G. A. (Royal Melbourne Hosp., Australia). *Aust New Zeal J Surg* 38(2):150-153, 1968.

Acute hemorrhagic pancreatitis was induced in dogs by occlusion of the duodenum proximal and distal to the entrance of the pancreatic ducts, ligation and division of the common bile duct, and gastrojejunostomy (to reestablish gastrointestinal continuity). All 10 dogs receiving either no treatment or isotonic saline i.v., beginning 8 hr after surgery (60 ml/kg over 12 hr), died within 22 hr. Of 5 dogs receiving dextran (molecular weight 70,000) i.v., beginning 6 hr after surgery (60 ml/kg over 12 hr), 3 survived more than 30 hr and 2 died within 22 hr. Fifteen dogs received Trasylol (150,000 U over 12 hr) in isotoni

aline i.v.: 5 began therapy immediately after surgery (4 sur-
ived longer than 30 hr and 1 died within 18 hr), 5 began therapy
4 hr after surgery (3 survived longer than 30 hr), and 5 began
herapy 8 hr after surgery (all died within 22 hr). Duodenal
nstillation of neomycin (50 mg) and polymyxin B (25,000 U)
n 5 other dogs at the completion of the operation resulted in
3 surviving longer than 30 hr, while 2 died within 22 hr. Five
dditional dogs were given tetracycline (500 mg over 12 hr) i.v.,
eginning 8 hr after surgery; 1 survived more than 30 hr and
4 died within 22 hr. Trasylol and topical antibiotics seem to
ave a place in the treatment of acute pancreatitis.

65 **ABSCESSES OF THE PANCREAS.** *(E.)* Kune,
G. A. (Royal Melbourne Hosp., Australia). *Aust*
'ew Zeal J Surg 38(2):125-128, 1968.

'he etiology, diagnosis and treatment of pancreatic abscesses
re discussed on the basis of experience with 19 patients, in-
luding 2 with chronic relapsing pancreatitis and 17 in whom
bscess formation followed the first attack of pancreatitis. The
auses in this series were similar to those of uncomplicated acute
ancreatitis: gallstones (5), biliary tract surgery (4), alcoholism
4), parturition (1) and unknown (3). Cultures of the abscess
avities at operation revealed various organisms, regarded as
econdary to pancreatic necrosis. Clinical features included fever
nd leukocytosis (18), vomiting (8), pain (6), tenderness (10),
palpable mass (7) and jaundice (3). Barium-meal examination
evealed gastric or duodenal deformities in 4 of 5 patients ex-
mined. A high incidence of complications was noted, including
leural effusion (2), septicemia (3), renal failure (1), upper gas-
ointestinal bleeding (1), congestive heart failure (1) and hypo-
alcemia with tetany (1). There were 9 survivors and 2 deaths
llowing surgical drainage, while among 8 patients treated con-
rvatively there was only 1 survivor and 7 deaths. It is rarely
ecessary to perform other than external drainage of the abscess
vity.

6 **THE SITE OF BRADYKININ RELEASE IN
ACUTE EXPERIMENTAL PANCREATITIS.**
.) Popieraitis, A. S. (U. Surg. Clin., Montreal Gen. Hosp.,
Q., Canada) and A. G. Thompson. *Arch Surg* 98(1):73-76,
69.

easurements of bradykinogen in pre- and post-pancreatic blood
vealed an intrapancreatic loss of the precursor in the course
pancreatitis induced in splenectomized dogs by infusion of
5 ml/kg 4% sodium taurocholate and 75,000 BAEE U crys-
lline trypsin into the main pancreatic duct. Prepancreatic
od was collected from the aorta, cannulated via a femoral
ery; postpancreatic blood was collected from the portal vein,
mulated via the splenic vein, following ligation of surrounding
ns so that only blood from the superior pancreatico-duodenal
l dorsal pancreatic veins was collected. Immediate pretreat-
nt with the proteinase inhibitor aprotinin (10,000 U/kg) re-
ted in an appreciable decrease in the arteriovenous brady-
inogen difference. It is concluded that the bradykinin re-
sed during acute experimental pancreatitis is largely produced
hin the pancreas.

**SURGICAL MANAGEMENT OF CHRONIC
RELAPSING PANCREATITIS.** *(E.)* Warren, K. W.
hey Clinic Found., Boston, Mass.). *Amer J Surg* 117(1):24-
1969.

A review of experiences at the Lahey Clinic during the last 30 yr with 530 patients treated for chronic relapsing pancreatitis, who were followed for 1-23 yr, indicates that the disease is associated with a wide variety of antecedent conditions and is complicated by many mechanical, physiologic and metabolic consequences. Choice of a suitable operative procedure is still the most controversial feature of the illness. In the early experience of the clinic, 128 procedures were performed on the biliary or gastrointestinal tract or on the autonomic nervous system, since duct obstruction is the chief feature in chronic pancreatitis. Satisfactory long-term results were achieved in 43 of 70 patients treated by cholecystectomy, bile duct exploration or choledochoduodenostomy, in 19 of 39 sphincterotomies (alone or with cholecystectomy or choledochostomy), in 4 of 6 subtotal gastrectomies or gastrojejunostomies, and in 2 of 13 bilateral or unilateral dorsolumbar sympathectomies (with or without splanchnicectomy). These procedures were especially unsatisfactory in cases of advanced chronic pancreatitis. Modern surgery directed to the pancreas itself achieved satisfactory long-term results in 70% of 418 cases. Results were satisfactory in 50 of 70 procedures for pancreatic cysts and abscesses, in 111 of 155 transduodenal decompressions, in 15 of 25 transpancreatic ductal decompressions, in 57 of 73 distal pancreatectomies, in 56 of 82 pancreaticoduodenectomies, and in 7 of 8 total pancreatectomies. Unsatisfactory results were related to inappropriate choice of operative procedure, continued alcoholism, and persistence of residual pancreatic inflammatory disease.

668 **PERITONEAL DIALYSIS IN ACUTE EXPERIMENTAL PANCREATITIS.** *(It.)* Casciani, C. (Surg. Clin., U. Rome, Italy), M. Carboni, G. Cucchiara, V. Boffo, E. Ancarani, A. Arullani and R. Cortesini. *Policlinico [Prat]* 75(46):1501-1514, 1968.

Acute pancreatitis was induced in 30 dogs by injecting a mixture of 10 ml bile, 25,000 units trypsin, 15,000 units chymotrypsin, and 10,000 units elastase through a needle inserted into the main pancreatic duct through a hole made in the duodenum. The dogs were divided into 3 groups: 1) 10 which were given only i.v. infusions of Trasylol, hydrocortisone, and antibiotics; 2) 10 which were given peritoneal dialysis 8 hr after surgery; and 3) 10 which were given peritoneal dialysis immediately after induction of pancreatitis. In addition to glucose and electrolytes, the solution used in peritoneal dialysis contained 100 mg hydrocortisone hemisuccinate, 10 mg butazolidine, 9 mg phytohemagglutinin, 10 mg adenosine phosphate, 10 mg adenosine, 10 mg inosine, and 25 mg 6,8-dithiocaprylic acid. All animals in group (1) died in a state of shock within 20 hr and had diffuse acute hemorrhagic necrotic pancreatitis on autopsy. Of the 10 animals in group (2), 9 died within 72 hr after induction of pancreatitis and 1 died after 2 yr. Autopsies showed localized necrotic pancreatitis. All animals in group (3) survived for 2 yr. During the first 12 hr, serum amylase and trypsin levels were much higher in groups (1) and (2) than in group (3).

669 **THE DIAGNOSIS AND MANAGEMENT OF PANCREATITIS.** *(E.)* Marks, I. N. (Groote Schuur Hosp., CapeTown, South Africa). S. Bank and J. H. Louw. Pp. 412-472 in *Progress in Gastroenterology.* Vol. 1. Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

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670 THE DIAGNOSIS AND TREATMENT OF ACUTE PANCREATITIS. *(Rus.)* Kolomiichenko, M. I. (A. A. Bogomolets Med. Inst., Kiev, USSR) and S. I. Rybakov. *Khirurgiia (Moskva)* 44(8):60-65, 1968.

671 RELATIONSHIP BETWEEN ACUTE PANCREATITIS AND HYPERLIPEMIA. *(E.)* Zieve, L. (Minneapolis Vet. Hosp., Minn.). *Med Clin N Amer* 52(6):1493-1501, 1968.

672 PINPOINTING PANCREATITIS WITH LABORATORY TESTS. *(E.)* Benson, E. S. (U. Minnesota Med. Sch., Minneapolis). *Postgrad Med* 44(6):39-42, 1968.

673 ACUTE PANCREATITIS AFTER SURGERY ON THE BILIARY TRACT AND STOMACH. *(Rus.)* Topchiashvili, Z. A. (Cent. Inst. Postgrad. Med., Moscow, USSR) and N. I. Prokopenko. *Klin Khir (Kiev)* (11):1-3, 1968.

674 CHANGES IN SOME BIOCHEMICAL PARAMETERS IN PATIENTS WITH PANCREATIC NECROSIS. *(Rus.)* Zaitsev, V. G. (N. I. Pirogov 2nd Moscow Med. Inst., USSR). *Klin Khir (Kiev)* (11):4-8, 1968.

675 MASSIVE BILATERAL HEMORRHAGIC PLEURAL EFFUSIONS IN CHRONIC RELAPSING PANCREATITIS. *(E.)* Miridjanian, A. (New York VA Hosp., N. Y.), V. N. Ambruoso, B. M. Derby and D. A. Tice. *Arch Surg* 98(1):62-66, 1969.

676 PANCREATITIS–ACUTE AND CHRONIC. *(E.)* Trapnell, J. E. (Roy. Victoria Hosp., Boscombe, England). *Brit J Hosp Med* 1(2):181-189, 1968.

See also: 206,562

LIVER AND BILIARY TRACT

677 **BLOODLESS HEPATIC RESECTION WITH AN INTERNAL CAVAL SHUNT.** *(E.)* Timmis, H. H. (U. Mississippi Med. Ctr., Jackson, Miss.), A. R. Rosanova Jr. and W. B. Larkin. *Surgery* 65(1):109-117, 1969.

A technique for isolating the hepatic circulation during liver resection was evaluated in terms of survival and liver function in normothermic adult dogs. The method, which is similar to that of Buckberg *et al (Surgery* 63:446, 1968), involves isolation of the hepatic vena cava between constricting tapes and venous return through an internal suprarenal caval catheter inserted through the right atrium. The results were found to depend on the duration of hepatic ischemia. Dogs subjected to hepatic circulatory exclusion for 40-60 min without resection (3) or with multiple lobectomy (10) died with hepatic cyanosis and congestion, splanchnic congestion, and declining liver function. Animals subjected to ischemia for less than 30 min without resection (3) or with single (5) or partial (1) lobectomy survived with normalization of liver function studies within 5 days. Use of the method is proposed in emergency hepatic resection for control of massive bleeding.

678 **ACUTE OBSTRUCTIVE SUPPURATIVE CHOLANGITIS.** *(E.)* Hinchey, E. J. (Montreal Gen. Hosp., Canada) and C. E. Couper. *Amer J Surg* 117(1): 62-68, 1969.

Case histories are presented for 24 patients (11 men and 13 women), 17 of whom were more than 60 yr old. Nineteen had histories of biliary tract disease lasting from a few months to 20 yr and 6 had undergone biliary tract surgery. All patients were febrile at some time during their hospital stay with temperatures ranging from 101 to 105F. Bilirubin levels were above normal limits in 22 of the 23 patients for whom they were available. Serum alkaline phosphatase levels from 21 patients were normal in 3 cases, slightly elevated in 8, and significantly elevated in 10. SGOT values from 19 patients were normal in 3 cases, slightly elevated in 6, and significantly elevated in 10. Prothrombin times from 20 patients were normal in 11 and elevated in 9. Platelet counts were below the normal limit n 6 of the 10 cases in which they were made. Patients were classified into 5 groups on the basis of their clinical course. Of the 8 deaths that occurred, 6 were among patients admitted n shock whose conditions showed no improvement, or improved and then deteriorated, before emergency surgery was performed. Surgery was not performed on the other two patients who died. These findings show that patients treated conservatively are still at high risk until the infected biliary ract is decompressed.

79 **USES OF THE BALLOON-TIPPED CATHETER IN BILIARY TRACT SURGERY.** *(E.)* Anderon, R. P. (Johns Hopkins U. Sch. Med., Baltimore, Md.), P. M. Leand, and G. D. Zuidema. *Amer J Surg* 117(1):55-61, 1969.

Case reports are presented to illustrate the use of balloon-tipped atheters in biliary tract surgery and diagnosis. Surgical uses ncluded: (1) removal of a stone from each hepatic radical and n impacted stone from the ampullary portion of the common ile duct; (2) removal of several stones from a very small common bile duct and many small stones from both hepatic radials; and (3) removal of an elusive stone from the right hepatic duct in a dilated biliary system. Diagnostic uses included: (1) removal from the hepatic ducts of gelatinous material shown by biopsy to come from a mucus-producing adenocarcinoma of the pancreas in a patient with obstructive jaundice; (2) location of an adenocarcinoma of the pancreas which was obstructing the common bile duct; and (3) obstruction of the outflow of contrast medium through the ampulla to obtain a well-defined cholangiogram.

680 **PHYSIOLOGIC CONSIDERATIONS IN MAJOR HEPATIC RESECTIONS.** *(E.)* Stone, H. H. (Emory U. Sch. Med., Atlanta, Ga.), W. D. Long, R. B. Smith, III and C. D. Haynes. *Amer J Surg* 117(1):78-84, 1969.

The factors responsible for death or major complications are reviewed in a series of 38 patients subjected to hepatic resection (10-90%) for hepatic trauma (22 cases), neoplasms (12 cases) or other reasons. The overall mortality was 32% (12 deaths). There was an inverse relation between mortality and the total amount of functioning liver remaining after surgery. Splanchnic sequestration of blood volume, hypoglycemia, or intractable ascites, complications which seemed to be directly related to the extent of the resection, were responsible for 5 of the 12 deaths. Significant reductions in the levels of clotting factors occurring postoperatively were proportional to the amount of liver excised. Transient postoperative jaundice occurred, but serum bilirubin levels rarely exceeded 6 mg%. Bile production increased to levels approaching normal within 10 days. Intravenous glucose and supplemental albumin requirements were also found to be a function of the percentage of the liver excised.

681 **COAGULATION DURING AND AFTER ORTHOTOPIC TRANSPLANTATION OF THE HUMAN LIVER.** *(E.)* Groth, C. G. (Dept. Surg., U. Colorado Sch. Med., Denver), L. Pechet and T. E. Starzl. *Arch Surg* 98(1):31-34, 1969.

A study of blood clotting factors following transplantation of the liver in 10 cases showed that the clotting abnormalities previously found following hepatic homotransplantation in dogs and pigs appear in man as well. Transplantation of the liver caused fibrinolysis, thrombocytopenia and depression of various clotting factors. These changes were prognostic in that they were proportional to the magnitude of liver injury; 2 patients with poor homograft function showed severe and persistent changes, whereas 8 with satisfactory immediate liver function showed only minor and reversible changes which did not require treatment with thrombogenic agents. There was little or no evidence that hypercoagulability followed depression of clotting in the absence of thrombogenic treatment. Subsequent liver failure in 2 cases, 4.5 and 6 months after transplantation, was accompanied by decreases in those clotting factors synthesized by the liver.

682 **THE SIGNIFICANCE OF AIR IN THE BILIARY SYSTEM AND LIVER.** *(E.)* McSherry, C. K. (New York Hosp. Cornell Med. Ctr., New York City), W. T. Stubenbord and F. Glenn. *Surg Gynec Obstet* 128(1):49-61, 1969.

The meaning of noniatrogenic air or gas shadows within the biliary tract and liver on roentgenograms of the abdomen is discussed and illustrated by means of 11 pertinent case histories. Those in the gallbladder are usually the result of bacteria infection of the lumen or wall. Those within the bile ducts are usually the result of fistulas to the digestive tract caused by calculous disease of the gallbladder or, less commonly, by primary tumors in the stomach, duodenum, or small and large intestine. Gas shadows within the liver parenchyma can be caused by communication through the ductal system to the gastrointestinal tract or by hematogenous or cholangiolitic abscess. Such findings have serious implications and require immediate treatment.

683 **THE NATURAL HISTORY OF PRIMARY AND SECONDARY MALIGNANT TUMORS OF THE LIVER. I. THE PROGNOSIS FOR PATIENTS WITH HEPATIC METASTASES FROM COLONIC AND RECTAL CARCINOMA BY LAPAROTOMY.** *(E.)* Bengmark, S. (Dept. Surg., U. Göteborg, Sweden) and L. Hafström. *Cancer* 23(1):198-202, 1969.

Of 156 patients (84 men and 72 women, 38-94 yr old) operated on for colonic and rectal carcinoma during 1964-66, 38 (24.5%) had hepatic metastases. Preoperative laboratory studies revealed increased serum alkaline phosphatase levels in 18 (56%) and hyperbilirubinemia in 4 (13%) of these patients. Primary tumor resection was performed in 22, a decompression procedure in 12, and only an exploratory laparotomy in 4. Twenty-four patients died within 6 months, 30 within 12 months, and all except 1 within 18 months. The survival rate was not influenced by the age of the patient, location of the primary tumor, or the type of palliative large bowel operation performed. The patients with elevated serum alkaline phosphatase levels at the time of surgery had a shorter mean survival than those with normal values: only 1 of 18 (6%) was alive after 7 months compared to 9 of 14 (64%). Of the patients with jaundice, 2 died postoperatively, 1 within 3 and 1 within 18 months. Of the 4 patients undergoing laparotomy alone, 2 died postoperatively, 1 within 2 and 1 within 3 months. The average survival time for the whole series was 5.7 months.

684 **METABOLIC CHANGES FOLLOWING MAJOR HEPATIC RESECTION.** *(E.)* Aronsen, K. F. (Malmö Gen. Hosp., Sweden), B. Ericsson and B. Pihl. *Ann Surg* 169(1):102-110, 1969.

Postoperative metabolic changes were studied prospectively in 10 patients (8 men and 2 women, 20-72 yr old) subjected to major hepatic resection for primary or metastatic liver cancer, hepatic injury or cirrhosis. All patients had healthy residual liver tissue and none had biliary stasis before surgery. Blood urea and creatinine were in the normal range, indicating no significant impairment of renal function. Hematocrit and hemoglobin were consistently slightly reduced and blood sugar was increased during the entire 22-day observation period. Coagulation derangements (reported previously) included decreases in factor V, factor IX, fibrinogen, plasminogen and prothrombin. Serum potassium, sodium and chloride were substantially depressed for the first 7 days, while standard bicarbonate increased during the first 3 days and serum calcium was within the normal range. Serum bilirubin increased immediately after surgery but decreasing to near normal after 3 weeks. SGPT showed a similar early rise, but fell more rapidly toward normal. Preoperatively increased alkaline phosphatase and serum gamma-glutamyl-transpeptidase values decreased toward normal immediately after the operation and then gradually rose. Thymol turbidity readings, initially normal, began to rise 10 days after surgery. Serum cholesterol dropped considerably following surgery but reached normal values in 20 days. Serum haptoglobin also fell slightly on the first day and then rose to the upper limit of its normal range of variation. Total serum protein, at first depressed, began to rise on the third postoperative day, reaching its original value after 2 weeks. All protein components except albumin (large amounts of human albumin were administered during and after surgery) were reduced immediately after the operation. The γ-globulin began to increase after 10 days and reached levels even higher than the limit of the normal range. A comparison of two patients with extended right-sided lobectomy, in whom the extent of resection was anatomically equal but the amount of healthy tissue removed differed, showed that the severity of postoperative metabolic changes varied inversely with the size of the lesion. It is possible that residual healthy tissue in patients with a relatively large tumor undergoes compensatory hyperplasia.

685 **ENZYME AND FUNCTION CHANGES AFTER EXTENSIVE LIVER RESECTION IN MAN.** *(E.)* Almersjo, O. (Dept. Surgery, U. Göteborg, Sweden), S. Bengmark, L. O. Hafström and R. Olsson. *Ann Surg* 169(1):111-119, 1969.

The SGOT, SGPT, ornithine-carbamoyl transferase (OCT) and alkaline phosphatase (AP) activity, as well as bilirubin concentration and BSP retention, were assayed in 12 patients (2 men and 10 women, 20-71 yr old) prior to and 1-4 weeks following extensive hepatic resection for primary or metastatic cancer. Individual case reports are presented and the detailed biochemical changes are tabulated. Maximum SGOT and SGPT activity after resection varied from near normal to pronounced elevations, and the 2 enzymes were not consistently related. The time required for return of the transaminases to normal was very variable and bore no relation to the extent of hypertransaminasemia or of resection. The extent of hypertransaminasemia showed no correlation with extent or type or resection, age, presence or absence of metastases in the hepatic remnant, use of fluorothane, or number of pints of blood administered during the surgery or 24 hr postoperatively. An inverse relation was demonstrated between the duration of the operation and the degree of hypertransaminasemia. Use of T-tube drainag also was associated with lower transaminase values. AP activity was slightly influenced by the surgery, pronounced changes bein evident only in 3 cases with markedly elevated preoperative levels. The most pronounced postoperative elevations of OCT activity occurred in the 2 patients with the greatest serum transaminase elevations. Serum bilirubin concentration and BSP retention were related to the extent of the resection only.

686 **CLINICAL AND PATHOLOGIC OBSERVATIONS AFTER ORTHOTOPIC TRANSPLANTATION OF THE HUMAN LIVER.** *(E.)* Starzl, T. E. (U. Colorado Sch. Med., Denver), K. A. Porter, E. Brettschneider, I. Penn, P. Bell, C. W. Putnam and R. L. McGuire. *Surg Gynec Obstet* 128(2):327-338, 1969.

Among 14 patients receiving orthotopic liver transplants since July of 1967, 3 died in the immediate postoperative period due to occlusion of either the portal vein or the common

iepatic artery, 6 died 35-400 days postoperatively due to
hrombosis of the right hepatic artery (4 cases), pneumonia or
arcinomatosis, and 5 were still alive after 8.5, 7, 6, 5 and 3
nonths. One of these survivors received a second orthotopic
ransplant after the rejection of the original homograft. Dis-
ontinuation of heterologous antilymphocyte globulin, given
ogether with azathioprine and prednisone, was followed by
elayed rejection in 5 of 6 patients in 1-8 weeks. Four of the
ecipients had been operated on because of hepatoma, and
ietastases developed in 2; however, 2 of the 4 were among
ie survivors. The liver homografts were examined in 11 cases
p to 13 months after surgery. In 7 of 8 long-surviving patients,
ie livers developed infiltrates of lymphoid cells which decreased
ter the first month in all but 1 case of uncontrollable rejection.
ortal fibrosis developed in 7 of the grafts, and progressed to
rrhosis in 2 of 7. Centrilobular cholestasis and condensation
reticulum were present in 6 of the grafts, and in 4 there was
ickening in the intima of the small branches of the hepatic
teries, presumably due to rejection.

7 THE PRINCIPLE OF FUNCTIONAL COMPETITION IN HETEROTOPIC LIVER TRANS-
LANTATIONS. *(Fr.)*

Schalm, L. (Munic. Hosp., Arnhem,
etherlands). *Rev Medicochir Mal Foie* 43(5):175-180, 1968.

mple heterotopic liver transplants were performed on 9 dogs
such a way that blood from the portal system of the re-
pient did not flow through the transplant. Although bile
oduction was good immediately after surgery, it decreased
nsiderably 5-7 days later and usually stopped completely
ter 11 days. Autopsies, performed 15-35 days after surgery,
owed that the transplants had atrophied in all animals. This
lure is attributed to functional competition since physiological
nditions in the recipient's own liver were much better than
ose in the transplant. Heterotopic liver transplantation com-
ied with portacaval shunts and ligation of the common bile
ct was performed on 14 dogs. Immunological rejection of
transplant was responsible for the death of 2 dogs imme-
tely after surgery. Atrophy of the transplant occurred in 3
es, but in 2 it was traced to insufficient obliteration of the
ary tract in the recipient. In the other 9 dogs the liver trans-
nt continued to function until their death which occurred
veeks to 3 months after surgery. Autopsies, performed on
f these dogs, showed an increase in the size of the transplant.
the other 4, the weight of the transplanted liver tissue re-
ined the same and no signs of atrophy were found. The
cess of this technique is attributed to lack of functional com-
ition since physiological conditions in the donor liver were
ter than those in the recipient's own.

STUDIES ON THE PATHOGENESIS OF HEPATOLENTICULAR DEGENERATION. III. THE
ECT OF COPPER ON RAT LIVER LYSOSOMES. *(E.)*

lquist, R. R. (Peter Bent Brigham Hosp., Boston, Mass.).
er J Path 53(6):903-927, 1968.

in vivo effect of copper on liver lysosomes was studied in
ng, healthy, male Sprague-Dawley rats weighing 120-150 g
given 4 μmoles cupric chloride/100 g body weight daily
for 1 week. Control animals received the same dosage of
um chloride. Copper was demonstrated cytochemically in
livers as granules with a distribution similar to that of the
somes. Lysosomes (residual bodies and autophagic vacuoles)
increased in number in copper-loaded livers, and focal interruptions of lysosomal membranes with loss of subjacent lysosomal matric suggested the occurrence of intracellular lysosomal rupture. Unbound activities of 3 lysosomal enzymes (acid phosphatase, cathepsin, and sulfatase) were increased in the livers of animals receiving copper. This increase was greater than the increase in total activity, indicating an intracellular shift in the 3 lysosomal enzymes from sedimentable to nonsedimentable cellular fractions. Addition of cupric chloride to emulsions of unsaturated fatty acids *in vitro* initiated peroxidation of these lipids as indicated by the thiobarbituric acid test for lipid peroxidation products. Addition of cupric chloride to suspensions of lysosomes isolated from rat livers led to release of acid phosphatase from the particulate fraction. The release of acid phosphatase was associated with peroxidation of lysosomal lipids. Livers from rats receiving i.p. injections of cupric chloride also had greater thiobarbituric acid reactivity than control livers, indicating lipid peroxidation, and the lipids of lysosomes isolated from copper-loaded livers absorbed in the 230-236 mμ region, which is characteristic of conjugated dienes. Such lysosomes were also more susceptible to further lipid peroxidation and to release of acid phosphatase and β-glucuronidase when exposed to ultraviolet radiation or hyperbaric oxygen. These data suggest that copper, sequestered by the liver lysosomes, may initiate lipid peroxidation with resultant damage to lysosomal membranes and leakage of injurious acid hydrolases into the cytoplasm.

689 TREATMENT OF HEPATIC COMA BY EXTRACORPOREAL PIG-LIVER PERFUSION. *(E.)*

Abouna, G. M. (Royal Victoria Infirm., Newcastle upon Tyne, England), J. R. Kirkley, C. J. Hull, T. Ashoroft and D. N. S. Kerr. *Lancet* 1(7585):64-68, 1969.

Experience with extracorporeal pig-liver perfusion in 4 patients in hepatic coma, using an effective technique which incorporates a perfusion chamber of new design, has shown that this is a safe and rational procedure for temporary hepatic support, and that with a good technique the extracorporeal liver performs many of the metabolic functions of a healthy liver. Seven perfusions, successfully maintained for 5-10 hr, were performed on 3 males (6-47 yr old) and 1 woman (30 yr old) who had been in deep coma for 48-72 hr due to severe hepatic necrosis and had failed to respond to standard medical treatment. The 4 case reports are presented in detail. Although all 4 patients ultimately died (5-10 days after onset of coma), complete recovery of consciousness occurred during one of the 7 perfusions, lightening of coma in 5, and neurological improvement in another. Striking biochemical and hematological improvement was seen in all cases, including a notable reduction in blood-ammonia and bilirubin and a significant rise in prothrombin and other coagulation factors. The serum alkaline phosphatase and transaminases fell. Histological evidence of liver-cell regeneration was found in 3 cases. To allow adequate hepatic regeneration, extracorporeal liver perfusion must be repeated at frequent intervals and for considerable periods of time.

690 JAUNDICE IN ACUTE APPENDICITIS. *(E.)*

Miller, D. F. (Southern Gen. Hosp., Glasgow, Scotland) and R. W. Irvine. *Lancet* 1(7590):321-323, 1969.

A prospective study to establish the incidence and investigate the cause of jaundice in acute appendicitis was prompted by an earlier report of 6 cases of jaundice among 391 appendectomies (all 6 had a highly placed retrocecal appendix). In 120 consecutive cases of acute appendicitis seen over a 6-month period, 8 of 29 patients requiring drainage of the peritoneal cavity and 1 not needing drainage showed some degree of jaundice. All patients had routine liver function tests (serum bilirubin, alkaline phosphatase, zinc turbidity, thymol turbidity, SGOT and SGPT) on the 1st and 4th postoperative days. Urine was tested for bile and excess urobilinogen on the same days. Cultures were taken at operation and from the wound when the drain was removed. If any of the biochemical tests were abnormal or if the patient became clinically jaundiced, serial determinations were made until they returned to normal. The onset of jaundice occurred between the 1st and 4th postoperative day and lasted 1-9 days. Serum bilirubin was elevated in all 9 cases (maximum of 2.5 mg%), alkaline phosphatase was elevated in 2 cases (21.5 and 67.8 King-Armstrong units), other liver function tests were normal. Bile was present in the urine in 4 cases. *E. coli* was isolated from all 8 jaundiced cases requiring drainage and from only 11 of the remaining 21 cases requiring drainage. None of the 9 jaundiced patients had a high retrocecal appendix. There was no evidence of postoperative bleeding from the wound or into the peritoneal cavity. There was no difference in the age or sex distribution between the affected and unaffected groups.

691 **IMMUNOLOGIC COMPETENCE OF THE LIVER FOR PRODUCTION OF ALLERGIC ENCEPHALOMYELITIS.** *(E.)* Levine, S. (Bird S. Coler Hosp., Welfare Island, N. Y.) and R. Sowinski. *Arch Path* 87(2):223-227, 1969.

Experimental allergic encephalomyelitis (EAE) was produced in male Lewis rats by injection of neural antigen with Freund's adjuvant into the liver, spleen, or mesenteric veins. Removal of the spleen did not prevent EAE after intrasplenic inoculation. Droplets of inoculum with attendant granulomatous inflammation were restricted to the liver following injections into the spleen (with subsequent splenectomy) or mesenteric veins (with prior splenectomy). Therefore, the liver was thought to be the site of formation of encephalitogenic cells in these studies. The production of EAE by intrahepatic inoculation was not suitable for elucidating the immunologic function of the liver, since inoculum spread from the liver to the peritoneal cavity, mediastinal lymph nodes, and lungs. Intravenous pertussis vaccine augmented both EAE and the granulomatous reaction in the liver.

692 **OBSTETRIC HEPATOSIS: TREATMENT WITH CHOLESTYRAMINE AND INTERIM RESPONSE TO STEROIDS.** *(E.)* Lutz, E. E. (U. California San Francisco Med. Ctr., San Francisco) and A. J. Margolis. *Obstet Gynec* 33(1):64-71, 1969.

During an 18-month period, 34 pregnant patients who complained of itching were evaluated for obstetric hepatosis (cholestatic jaundice). Of the liver function tests performed to differentiate obstetric hepatosis from viral hepatitis, congenital hyperbilirubinemia, hemolytic sickle-cell anemia, spherocytosis or drug-induced jaundice, the most valuable were the serum bilirubin, SGOT, alkaline phosphatase, and BSP retention. Cholestyramine was given to 24 women (3 g three times daily, although 2 patients required higher dosages to control itching) for up to 12 weeks, terminating with the onset of labor. On the basis of clinical findings, laboratory tests and responses to treatment with cholestyramine, 3 groups were identified: 1) 20 patients with pruritus and obstetric hepatosis; 2) 14 with pruritus without obstetric hepatosis; and 3) 21 controls (normal pregnant females). One patient with obstetric hepatosis received exogenous steroids for 18 months postpartum. Of 17 patients with obstetric hepatosis receiving cholestyramine, 5 had complete relief, 9 had sufficient relief to permit comfortable sleeping, and 3 had no relief (2 of these received the drug for less than 1 week prior to delivery). Side-effects included mild nausea, epigastric fullness, and distaste for the drug; only 1 patient in group 1 discontinued the drug because of side-effects. Of 7 patients in group 2 who were given cholestyramine, 2 had a minimal decrease, while 5 had no change in the severity of itching. In the single patient receiving exogenous steroids, both estrogen and progesterone produced pruritus. Liver function studies changed with progesterone but remained within normal limits. Increased BSP retention was observed during the administration of mestranol with norethynodrel as well as during ethinyl estradiol administration. Evaluation of abnormal liver function tests showed no significant differences between the 2 groups with pruritus and the controls.

693 **EXCESSIVE URINARY EXCRETION OF CERTAIN PORPHYRINOGENIC STEROIDS IN HUMAN ACUTE INTERMITTENT PORPHYRIA.** *(E.)* Goldberg, A. (Western Infirm., Glasgow, Scotland), M. R. Moore, A. D. Beattie, P. E. Hall, J. McCallum and J. K. Grant. *Lancet* 1(7586):115-118, 1969.

Individual urinary 17-hydroxysteroid excretion was measured by gas-liquid chromatography in 6 patients (2 men, 4 women; 21-46 yr old) with acute intermittent porphyria. There were significant elevations of etiocholanolone glucuronide in 2 patients, of dehydroepiandrosterone glucuronide and sulfate in 2 patients, and of epiandrosterone sulfate in 3 patients. Of the 4 patients who showed these abnormalities, 2 were in relapse, and 2 had had severe attacks 8 months and 2.5 yr prior to the study. The 2 patients with a normal pattern of urinary 17-hydroxysteroid excretion had been in remission for 15 and 4.5 yr. Based on these results, free dehydroepiandrosterone or its sulfate (0.5 mg/daily) was injected i.p. into male Sprague-Dawley rats; this resulted in significant elevations of hepatic δ-aminolevulinic acid synthetase, reaching maximal levels at 72 hr. An endogenous factor has therefore been found in some patients with acute intermittent porphyria which may explain certain clinical associations, such as the age of onset after puberty, and the occurrence of attacks not attributable to exogeno factors.

694 **PIGMENT FUNCTION OF THE LIVER IN SOME RESPIRATORY AND CIRCULATORY DISEASE** *(Rus.)* Frankfurt, A. I. (Vitebsk Med. Inst., USSR), N. Ie. Fedorov and N. G. Gurin. *Vrach Delo* (10):39-42, 1968.

Serum bilirubin fractions and urinary urobilin were determined in 96 patients with circulatory insufficiency due to rheumatic heart disease, atherosclerotic cardiosclerosis, or cor pulmonale; in 110 with chronic pneumonia; and in 20 normal controls. Total serum bilirubin was elevated in 39 of the 127 (31.7%) patients with circulatory insufficiency and in only 13 (11.8%) of the 110 with chronic pneumonia. The highest levels of free serum bilirubin and bilirubin monoglucuronide were found in patients with circulatory insufficiency due to rheumatic heart disease. The bilirubin diglucuronide fraction decreased progressively with increasing circulatory insufficiency. Among patient vith chronic pneumonia the free and bilirubin monoglucuronide ractions were larger in the more severely affected patients. Jrinary urobilin levels were abnormal in many patients with irculatory insufficiency. The mean level was significantly igher than normal in patients with all degrees of circulatory nsufficiency. Increased levels of free bilirubin in patients with irculatory insufficiency, chronic pneumonia, and compensated or pulmonale can be attributed to reduced glucuronyl transerase activity or to an increase in the rate of hemolysis. The itter is considered unlikely, because these patients did not have nemia or high urobilin levels. Treatment of patients with hronic pneumonia and circulatory insufficiency produced deeases in the mean values for total and free bilirubin and biliibin monoglucuronide and an increase in the bilirubin digluuronide fraction. The mean values for urinary urobilin excreon decreased significantly.

)5 **NONVIRAL NUCLEAR INCLUSIONS. I. CYTOPLASMIC INVAGINATIONS.** *(E.)*
obel, H. J. (Beth Israel Hosp., Passaic, N. J.), R. Schwarz and Marquet. *Arch Path* 87(2):179-192, 1969.

uclear inclusions were found in liver, adrenal, and kidney ssue from 46 of 106 consecutively autopsied patients; no nuear inclusions were found in the pancreas. These inclusion dies were found in liver parenchymal cells in 42 cases. The ratio was similar in subjects with and without inclusions, t most subjects with inclusions were older than those without. yperploid nuclei, found most often in the livers of elderly subts of both sexes, always contained many nuclear inclusions. aring the week before their death lanatacanth had been given to 14 of the 46 subjects with nuclear inclusions and other italis preparations had been given to 6 more patients with lusions. This suggests that the cardiac glycosides allow sodn and water to accumulate in the cells, producing cytoplasmic elling and eventual invagination into the nucleus.

5 **LIVER ULTRASTRUCTURE IN GILBERT'S DISEASE.** *(Fr.)* Feldmann, G. (Beaujon Hosp., chy, France), P. Oudéa, M. C. Domart-Oudéa, G. Molas and Fauvert. *Path Biol (Paris)* 16(21/22):943-953, 1968.

ctron microscope studies were run on liver specimens obned by needle biopsy from 6 patients (3 men and 3 women, d 20-40) with Gilbert's disease. All 6 patients had large mbers of heterogeneous pigment granules surrounded by a ple membrane and 5 of the 6 had polymorphic mitochondrial lusions. Other abnormalities, seen in 1 case each, were: elling of the endoplasmic reticulum; bile canaliculi with microvilli surrounded by dilated Golgi bodies and some olysomes; accumulations of ferritin surrounded by a simple mbrane; and a very small number of ruptures of the cell mbrane with the emission of some organelles into Disse's ces and the sinusoids. None of these abnormalities provided information about the nature of the disorder in bilirubin abolism.

HISTOLOGICAL AND FUNCTIONAL ASPECTS OF THE LIVER IN LEPTOSPIRAL JAUNDICE.
.) San Juan, F. (Hosp. State Employees, Rio de Janeiro, zil), F. Duarte, M. Treiger and A. J. Rios Gonçalves. *pital (Rio)* 74(4):1125-1148, 1968.

Liver function and histology were studied in 17 patients (14 males and 3 females, aged 10-60 yr) with positive serum agglutination tests for *Leptospira icterohaemorrhagiae* and jaundice. Hepatomegaly was present in 9 cases, hepatic coma in 1, and purpura in 5. The direct serum bilirubin fraction was elevated for the first 2 or 3 weeks and then decreased rapidly. Serum transaminase levels were normal or not significantly changed. In 8 cases alkaline phosphatase levels were higher than 20 King-Armstrong units and in 3 cases blood cholesterol levels exceeded 400 mg%. Cephalin flocculation and thymol turbidity tests gave inconclusive results. In most of these cases plasma prothrombin levels were very low, remained low during the acute stage of the disease, and did not respond immediately to vitamin K therapy. In 10 of the 15 patients studied serum albumin levels were low. Serum globulin levels were high in all 10 patients studied (elevated α_1-globulins in 2 cases, α_2-globulins in 3 cases, and γ-globulins in 5 cases). One patient responded to peritoneal dialysis; 2 others died. Examination of liver specimens obtained by biopsy or autopsy in 14 cases showed that the lesion was centrilobular in 12 cases with marked dilatation of the sinusoids, dilatation of the centrilobular veins, trabecular dissociation and disorganization of the hepatocytes. Other features were the same as those seen in toxic hepatitis.

698 **BILE MORPHOLOGY IN CHOLESTASIS.** *(E.)* Barone, P. (Inst. Path. Anat. Hist., U. Messina, Italy), G. Carrozza and C. Inferrera. *Acta Hepatosplen* 15(6): 389-399, 1968.

When liver biopsies from 3 patients with obstructive jaundice and 1 patient with acute viral hepatitis were examined by light and electron microscopy, various types of bile thrombi were noted, both extra- and intracellular. The most frequent consisted of mixtures of bile and canalicular membrane fragments, with a vast variety of transitional forms with vesicular, granular, membranous, and anulolamellar aspects. Intracellular bile clumps were found in vacuoles, Golgi vesicles, endoplasmic reticulum vesicles, and paranuclear regions, as well as free in the hyaloplasm. The thrombi and intracellular inclusions were generally negative to periodic acid-Schiff (PAS) and nonfluorescent. After exposure to ultraviolet light (15-60 min), autofluorescence was noted simultaneously with thrombi depigmentation, proceeding from the less pigmented to the more highly pigmented areas, and the periphery became PAS-positive. These findings indicate that bile thrombi consist of 2 main parts: the center, which is nonfluorescent, PAS-negative, and granular, and the periphery, consisting of an anulolamellar component which becomes autofluorescent and PAS-positive after thrombi depigmentation with ultraviolet light.

699 **PORTAL HYPERTENSION SYNDROME: A COMPARATIVE ANALYSIS OF BILHARZIAL FIBROSIS AND HEPATIC CIRRHOSIS.** *(E.)* Beker, S. (U. Hosp. Cent. U. Venezuela, Caracas) and J. Valencia-Parparcén. *Amer J Dig Dis* 13(12):1047-1054, 1968.

A comparative review of clinical and laboratory data from 115 patients with portal hypertension due to schistosomal fibrosis (45 cases), hepatic cirrhosis coexisting with schistosomiasis (30 cases), and hepatic cirrhosis alone (40 cases) revealed several differences which facilitate differential diagnosis. Patients with schistosomal fibrosis were younger (average age 36.4 yr compared to 51.7 yr in patients with hepatic cirrhosis alone with associated schistosomiasis). Hemorrhage from the gastrointestinal tract was more frequent in patients with schistosomiasis (90-91% versus 77.5%), while ascites, peripheral edema and jaundice were only found in patients with cirrhosis. Signs such as vascular spiders, palmar erythema, and hepatic precoma or coma were much more frequent in patients with cirrhosis. Hepatomegaly was somewhat more common in the presence of cirrhosis (73.3-82.5% versus 60%), while splenomegaly was a more prominent finding in schistosomiasis (43.3-48.9% versus 2.5%). There was a higher incidence of leukopenia in patients with schistosomal fibrosis, compared to only 10% of cirrhotic subjects. Liver function was impaired significantly more often in patients with cirrhosis, but a gradient between intrasplenic pressure and wedged hepatic vein pressure was observed only in patients with schistosomiasis. Medical treatment was given initially in 13.3% of patients with schistosomal fibrosis and 70% of those with cirrhosis. Subsequent surgery in selected patients yielded mortality rates of 27.4% and 69.4%, resp.

700 **A CONTRIBUTION TO THE EXPERIMENTAL SURGERY OF THE LIVER.** *(E.)* Vonk, J. (Dijkzigt Hosp., Rotterdam, Netherlands). *Arch Chir Neerl* 20(4):323-329, 1968.

In order to study the effects of ischemia and hypothermia on the results of liver resection, 6 groups of dogs were subjected to resection of the 3 right-sided liver lobes in an identical manner. The hepatic wounds were not covered and neither the abdominal cavity nor the biliary ducts were drained. Penicillin (1,000,000 units) was given twice daily for 5 days postoperatively; no blood or plasma substitutes were given. In group I, liver resection was performed without cooling or ischemia; the postoperative recovery was smooth with no mortality, and liver function was only minimally affected and rapidly (3 days) returned to normal. In group II, liver resection was performed with ischemia (clamping of the hepatoduodenal ligament) and cooling (physiological saline, 30C, applied over the liver) for 30 min: the results were the same as in group I, except for a more pronounced alteration in liver function. In group III, 30 min of ischemia with no cooling was used; animals were distinctly more ill and hepatic function was severely altered but returned to normal in 10 days. One animal died on the 2nd postoperative day. In group IV, ischemia and cooling were continued for 1 hr; no mortality was noted, and although liver function abnormalities were greater than in group II, liver function ultimately returned to normal and all animals recovered completely. In group V, ischemia was permitted for 1 hr without cooling: all 3 animals died within a few hr after operation; hemorrhage into the gastrointestinal tract and vomiting of blood and blood feces were noted. Hepatic function abnormalities were severe, and postmortem examination of the liver revealed depleted glycogen stores. In group VI, intermittent ischemia (hepatoduodenal ligament clamped for 10 min, opened for 5 min, reclamped for 10 min, etc. during 1 hr) without cooling resulted in no mortality.

701 **BROMSULPHTHALEIN METABOLISM IN ACUTE ALCOHOLIC LIVER DISEASE.** *(E.)* Wilkinson, P. (St. Vincent's Hosp., Melbourne, Australia), D. M. O'Day, K. J. Breen and J. G. Rankin. *Gut* 9(6):707-711, 1968.

In 27 males (27-59 yr old) with chronic alcoholism and 3 normal control males (27-47 yr old), the storage (S_{BSP}) and maximum rate of excretion (Tm_{BSP}) of BSP were independently measured according to the method of Wheeler *et al.*, and the values obtained were examined in relation to the clinical assessment, liver function tests and liver histology. Measurements of S_{BSP} and Tm_{BSP} were performed 2-19 days after the cessation of drinking; measurements were performed a 2nd time after 9-150 days of abstinence in 5 patients. A palpable, tender liver was noted in 16, reversible peripheral neuropathy in 8 patients, while none had evidence of cardiac disease. No patient was clinically jaundiced when studied (the highest serum bilirubin was 1.6 mg%). SGOT and alkaline phosphatase determinations were either normal or showed only slight rises (the highest SGOT was 95 Sigma-Frankel units/ml and the highest alkaline phosphatase was 16 King-Armstrong units/100 ml). Liver biopsies revealed a normal histology in 6, fatty infiltration in 6, acute alcoholic hepatitis in 6, and patchy cell necrosis in 3 patients. None had evidence of cirrhosis. The initial studies in the alcoholics revealed a reduction of S_{BSP} in 15, with normal Tm_{BSP} in all 27 patients. The defect in S_{BSP} could not be correlated with age, drinking habits, SGOT or alkaline phosphatase elevations, changes seen in the liver biopsies, or presence of peripheral neuropathy. The storage defect was most severe in those who had drunk most recently. Thirteen of the 15 patients studied within 1 week after alcohol withdrawal had abnormal S_{BSP} values, while all but 2 of the 12 patients studied 2-3 weeks after abstinence were normal. In the 5 patients studied for a 2nd time after 9-150 days of abstinence, the initially abnormal S_{BSP} values had all returned to normal. The change in BSP metabolism seen in these patients may be a specific effect of prolonged alcoholic excess or may be caused by other factors such as vitamin or protein deficiencies, excessive iron in certain alcoholic beverages, coexistent viral hepatitis, or some combination of these.

702 **THE EFFECT OF INTRAPERITONEAL OXYGEN ON THE RE-EQUILIBRATION OF LIVER HEMODYNAMICS AND HEPATIC REGENERATION.** *(Rum.)* Maros, T. (Med. Inst., Timisoara, Romania), L. Seres-Sturm, E. Balint and E. Poenaru. *Med Intern (Bucur)* 20(10):1259-1266, 1968.

Injection of 800-1000 ml O_2 into the peritoneum of 6 rabbits produced an increase in the O_2 concentration of blood from peripheral arteries. Injection of 2000 or 2500 ml O_2 into the peritoneum of 8 dogs prevented fluctuations in the O_2 concentrations in the portal and superior hepatic veins. Histological studies were then made of liver specimens obtained from 166 young rats at various intervals after removal of 70% of the liver by the method of Higgins and Anderson. Of these, 39 had been given 10-20 ml O_2 i.p. after hepatectomy, 22 had been given pure N_2 i.p. after hepatectomy, and 105 served as controls. No signs of peritoneal irritation were seen in any of the animals which had been injected with gas. In animals which had been treated with O_2 the regenerating liver regained its normal appearance 7 days after hepatectomy. In controls and rats treated with N_2 the liver remained yellow for about 11 days after surgery. O_2 produced a significant increase in the rate of mitosis 24 hr and 7 days after hepatectomy, but reduced the number of binucleate hepatocytes on the 3rd day. DNA and RNA were present in the liver in larger quantities and for longer periods of time in rats treated with O_2, and their livers increased in weight at a faster rate. This indicates that O_2 increases the rate of liver protein synthesis.

'03 **ACUTE OBSTRUCTIVE SUPPURATIVE CHOL-
ANGITIS.** *(E.)* Dow, R. W. (U. Michigan Med.
:tr., Ann Arbor) and S. M. Lindenauer. *Ann Surg* 169(2):272-
76, 1969.

'en patients (6 males and 4 females, 52-76 yr old) with acute
bstructive suppurative cholangitis were treated at the University
f Michigan Medical Center during 1951-1967. All were febrile,
inically jaundiced and complained of abdominal pain. Nine
f the 10 patients had significant episodes of hypotension which
nded to be late manifestations. Positive blood cultures were
otained in 5 cases, and bile cultures in 9. The overall mortality
as 60%. Eight of the 10 patients underwent operation during
e acute phase, and 4 of these survived, while the 2 patients
ho were not operated on died. The correct preoperative diag-
osis was made in 6 patients, including 3 of the 4 survivors.
3 patients who did not survive, the lack of a correct preoper-
ive diagnosis was associated with a delay in operative inter-
ntion. Multiple hepatic abscesses were a prominent feature in
4 patients who came to autopsy. Acute suppurative cho-
gitis is considered to be a terminal stage of ascending cho-
gitis. The importance of early recognition and prompt op-
tive intervention (drainage of the common bile duct) in this
ndition is stressed.

4 **CANCER METASTASIS TO THE CIRRHOTIC
LIVER: A STUDY OF EXPERIMENTAL AND
TOPSY MATERIAL.** *(E.)* Berge, T. (Gen. Hosp., Malmö,
eden) and T. Saldeen. *Acta Path Microbiol Scand* 74(3):340-
, 1968.

order to clarify the discrepancy between previous experi-
ntal reports indicating that injected tumor cells produce
ors more often in cirrhotic than in normal livers and
istical analyses of human autopsy material showing that
astasis is more common in noncirrhotic livers, the frequency
epatic metastasis was studied in rats with central (CCl_4-
ced) or portal (foreign-protein-induced) cirrhosis and in
psied human subjects with and without cirrhosis. The
portal injection of 10^6 Rous sarcoma cells into female
gue-Dawley rats resulted in a significantly higher number
etastases in rats with liver cirrhosis than in controls. Al-
gh more metastases were present in rats with foreign-pro-
cirrhosis than in those with CCl_4-induced cirrhosis, no dif-
ice was found between animals with and without cirrhosis
the tumor cells were injected directly into the liver.
efore, the fact that cirrhosis is usually portal in humans
central in experimental animals does not explain the above
epancy. Analysis of 10,160 autopsied subjects (34.3% with
nomas, of which 68.3% had metastasized; 3.8% with cir-
s, of which 24.2% had extrahepatic carcinoma) demon-
d that the significant difference in the frequency of hepatic
stasis in subjects with (52.8%) and without cirrhosis (68.9%)
o longer demonstrable when the difference in the total
ency of metastasis in the 2 groups was taken into account
% and 51.6%, resp.). Among tumors in an advanced stage
tastasis, all those with cirrhosis had metastasized to the
whereas only 88% of those without cirrhosis showed he-
metastasis, suggesting that if tumor cells once reach the
parenchyma, they establish secondaries more often in the
tic than in the noncirrhotic liver.

705 **BYLER DISEASE: FATAL FAMILIAL INTRAHEPATIC CHOLESTASIS IN AN AMISH KINDRED.** *(E.)* Clayton, R. J. (Georgetown U. Med. Ctr., Washington, D. C.), F. L. Iber, B. H. Ruebner and V. A. McKusick. *Amer J Dis Child* 117(1):112-124, 1969.

Clinical, biochemical and histological findings are presented for 7 Amish children from 4 related Amish sibships who showed a disorder characterized by progressive intrahepatic cholestasis. Loose, foul-smelling stools appeared within the 1st month of life and persisted throughout life. Jaundice (onset from 2-9 months of age) was episodic in nature during the early course of the disease (lasting 2-8 weeks) and persisted between episodic exacerbations late in the course (at 1-4 yr old). Other clinical characteristics were steatorrhea, hepatosplenomegaly and failure to thrive. Five of the 7 patients died between 17 months and 8 yr of age. Biochemical features of the disease included: hyperbilirubinemia, elevated serum alkaline phosphatase, normal to low serum cholesterol, and hypoprothrombinemia. On the basis of the observations on the children and data obtained from their parents (all 8 parents can be traced to a common ancestral couple; 2 fathers, presumed heterozygotes, showed depressed excretory capacity for BSP during a loading test; 2 mothers showed abnormality of a single-injection BSP during the last trimester of pregnancy), autosomal recessive inheritance of the disease is suggested. It appears that the primary defect is hepatic, and that transport of bile salts, BSP, and bilirubin across the canalicular membrane is impaired. Cholestyramine and a medium-chain triglyceride formula produced symptomatic improvement.

706 **BLOOD FLOW IN AUXILIARY CANINE LIVER HOMOGRAFTS.** *(E.)* Daloze, P. M. (U. Colorado Sch. Med., Denver), C. Huguet, C. G. Groth and F. Stoll. *J Surg Res* 9(1):10-12, 1969.

The blood flow through auxiliary hepatic homografts revascularized according to a slight modification of the Welch technique was studied in 10 dogs by measuring the washout of the inert radioactive gas ^{133}Xe; in 5 animals the blood flow through the host liver was also determined. No immunosuppressive therapy was employed. On the first postoperative day, the blood flow values obtained after portal injection of the isotope in the auxiliary livers ranged between 187 and 402 ml/min/100 g of tissue (average 283), and on the 3rd postoperative day the mean in 7 dogs was 225 ml/min/100 g of tissue. The blood flow values obtained after arterial injection of ^{133}Xe in 7 auxiliary liver homografts on the first postoperative day varied from 191 to 377 ml/min/100 g of tissue (average 227), and on the third day the average value of 4 dogs studied was 192 ml/min/100 g of tissue. The values obtained after portal injection were higher in the graft than in the host liver in 4 of 5 experiments. It appears that the revascularization with Welch's technique does not create inadequate portal flow in the homografts, suggesting that nonhemodynamic factors account for the atrophy of these grafts.

707 **DIAGNOSIS OF WILSON'S DISEASE IN CHILDREN WITH LIVER DISEASE: A REPORT OF TWO FAMILIES.** *(E.)* Danks, D. M. (Royal Child. Hosp., Melbourne, Australia) and B. J. Stevens. *Lancet* 1(7584):22-25, 1969.

Case reports are presented for 3 children (16-yr-old boy, his 10-yr-old sister, and a 16-yr-old girl) with cirrhosis of the liver in whom a diagnosis of Wilson's disease was made on the basis of complex laboratory and autopsy (2 cases) studies despite the absence of Kayser-Fleischer rings (except terminally in 1 case), normal or high levels of serum ceruloplasmin and copper, and only mildly increased urinary copper excretion. Urinary copper excretion after penicillamine was excessive in all cases, as was the copper content of the liver. The 1st 2 children, who died without adequate penicillamine therapy due to delayed diagnosis, were members of a family in which an older sister had also died of cirrhosis at the age of 12, although the parents and 5 other siblings were normal. The 3rd child, who was studied with ^{64}Cu and did well on penicillamine therapy, belonged to a family in which 2 older siblings had a history of "viral hepatitis" and several members had abnormal levels of urinary copper. In view of the effectiveness of long-term penicillamine therapy in Wilson's disease and the fatal course of the untreated condition, detailed diagnostic studies are urged in all cases of childhood cirrhosis. These studies should include slit-lamp examination of the cornea, serum copper and ceruloplasmin estimation, estimation of urinary copper before and after penicillamine, liver biopsy, and/or tests with ^{64}Cu.

708 **A TEN-YEAR REVIEW OF GASTRO-INTESTINAL HAEMORRHAGE DUE TO PORTAL HYPERTENSION IN CHILDREN.** *(E.)* Lannon, J. (Transvaal Mem. Hosp. Child., Johannesburg, South Africa) and V. E. Sorour. *S Afr Med J* 42(45):1231-1234, 1968.

The etiology, symptoms and treatment of 18 children (9 males and 9 females, 2-13 yr old) who presented with portal hypertension and variceal bleeding during 1957-66 at the Transvaal Memorial Hospital for Children are reviewed. Among 7 cases of extrahepatic portal obstruction, there was a history of congenital syphilis in 1, osteomyelitis in another, and no obvious etiological factor in the remaining cases. All had melena with normal liver function tests and liver biopsies. The spleen was palpable in 6 cases. Six patients required surgery after conservative management failed: splenorenal shunts (3 cases), transesophageal ligation of varices (1 case), esophagogastrectomy and colon interposition (1), and anastomosis of the inferior mesenteric to the left common iliac vein (1 case). All 7 children (follow-up of 6 months-5 yr) are well. Among 11 cases of intrahepatic portal hypertension, the etiology of the cirrhosis was biliary atresia in 3 cases, there was a history of bilharziasis and malaria in 1 case, and stenosis of the sphincter of Oddi in 1 case, and the etiology was unknown in the remaining 6. Hepatomegaly occurred in 9 cases, jaundice in 6 and ascites in 5. Liver function tests showed varying degrees of abnormality in all cases. One portacaval shunt and one thoracic duct drainage were done. Five children in this group died.

709 **STUDY OF DISORDERS IN HEME SYNTHESIS DURING DIFFERENT KINDS OF ANEMIA AND CHRONIC LIVER DISEASE.** *(Fr.)* Sroczynski, J. (Silesian Med. Acad., Zabrze-Rokitnica, Poland), H. Urbanowicz and M. Strynk. *Sem Hop Paris* 44(46):2819-2826, 1968.

Determinations were made of urinary Δ-aminolevulinic acid, porphobilinogen and coproporphyrin and erythrocyte protoporphyrin in 84 patients with anemia and 33 with liver disease. Patients with anemia included 32 with iron-deficiency anemia, 16 with secondary anemias due to chronic infections, 30 with anemias caused by malignant blood diseases or neoplasms, and 6 with pernicious anemia. Patients with liver disease included 27 with cirrhosis and 4 with chronic parenchymal hepatitis and amyloidosis. Δ-Aminolevulinic acid excretion was elevated in 7 anemic patients (2 with pernicious anemia, 4 with chronic leukemia, and 1 with Hodgkin's disease). Erythrocyte protoporphyrin values were significantly elevated in patients with iron-deficiency anemia and some of those with pernicious anemia and leukemia. While urinary Δ-aminolevulinic acid and porphobilinogen levels were normal in patients with liver disease, urinary coproporphyrin values were significantly elevated, particularly in cirrhotics, and erythrocyte protoporphorin values were decreased. There was a direct relation between urinary porphobilinogen and urinary coproporphyrin and an inverse relation between urinary Δ-aminolevulinic acid and urinary coproporphyrin. Urinary coproporphyrin was also directly related to blood bilirubin levels. These changes might be due to inhibition of the coproporphyrinogen cycle or a reduction in the amount of coproporphyrin excreted by damaged liver cells.

710 **LIVER DISEASES.** *(E.)* Nagashima, H. (Okayam U. Med. Sch., Japan). *Jap J Med* 7(3):173-175, 1968.

711 **PRIMARY PORTAL HYPERTENSION (REPORT OF 10 CASES).** *(E.)* Bhaleral, R. A. (K.E.M. Hosp., Bombay, India), K. P. Deodhar and G. Nerurkar. *J Postgrad Med* 14(3):129-132, 1968.

712 **THE PROBLEM OF HEPATIC STEATOSIS.** *(Ger* Theurer, D. (2nd U. Med. Clin., Charité Hosp., Berlin, Germany). *Deutsch Gesundh* 23(45):2113-2118, 1968.

713 **A CASE OF THE BUDD-CHIARI SYNDROME: CLINICAL AND PATHOLOGICAL STUDY AND ATTEMPTED CORRECTION BY THE CATHETER FRACTUR TECHNIQUE.** *(Jap.)* Hirooka, M. (Kyoto U. Med. Sch., Japan and C. Kimura. *Arch Jap Chir* 37(6):906-918, 1968.

714 **EXPERIENCE WITH THE USE OF A POLYVALENT INFUSION MIXTURE IN HEPATIC ENCEPHALOPATHY.** *(Cz.)* Blahniková, L. (Inst. Study Hum Nutrit., Prague, Czechoslovakia), J. Horký and R. Nonzák. *Cesk Gastroent Vyz* 22(5):293-299, 1968.

715 **TRANSPLANTATION OF THE LIVER.** *(Dut.)* Van der Heyde, M. N. *Nederl T Geneesk* 112(41 1823-1827, 1968.

716 **ISCHEMIA OF THE LIVER CAUSED BY PLICA TION OF THE CELIAC TRUNK.** *(Fr.)* Aron, E., J. P. Alfandari, B. Écarlat and C. Winckler. *Arch Franc Mal Appar Dig* 57(8/9):689-698, 1968.

717 **RESIDUAL POSTOPERATIVE FISTULAS IN HYDATID CYSTS OF THE LIVER.** *(Sp.)* Rua C. A. (Surg. Clin. D, La Plata, Argentina), A. Wilks and F. E. Ortiz. *Prensa Med Argent* 55(28):1351-1352, 1968.

718 **NEW TECHNIQUE FOR DIFFICULTLY ACCES SIBLE HYDATID CYSTS OF THE LIVER.** *(Sp*

mmoni, O. H. (Ital. Hosp., La Plata, Argentina), O. Molina rer and A. F. Pineda. *Prensa Med Argent* 55(28):1353, 58.

COMPLICATIONS DUE TO HEPATIC HYDATIDOSIS. *(Sp.)* Wilks, A. (Surg. Clin. D, La Plata, entina), F. E. Ortiz and J. C. Candia. *Prensa Med Argent* 28):1349-1350, 1968.

METHODS OF CHOICE IN HYDATID CYSTS OF THE LIVER. *(Sp.)* Ghiani, R. M. (Ital. Hosp., Plata, Argentina), H. Noel and O. Molina Ferrer. *Prensa Argent* 55(28):1338-1339, 1968.

VASCULAR CHANGES IN THE LIVER IN OBSTRUCTIVE JAUNDICE. *(Hun.)* Füsy, J. Med. Sci., Budapest, Hungary), G. Ungváry, G. Somogyi, óth and M. Ihász. *Kiserl Orvostud* 20(5):549-556, 1968.

ENZYME LEVELS IN THE BLOOD AND LIVER IN TWO CASES OF FATAL FULMINATING ATITIS TREATED BY EXCHANGE TRANSFUSION. *(It.)* o, F. (Inst. Gen. Clin. Med., U. Palermo, Italy), S. Le Moli, igneco, A. Notarbartolo and L. Pagliaro. *Riforma Med* 4):933-939, 1968.

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See also: 99,116,178,204,211,214,215,216,222,223,231,239,243,244,245,246,254,260,270,272, 279,281,282,283,290,291,294,295,300,306,671

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he case records of 303 patients with proved liver injuries seen ver a 5-yr period were reviewed. The 193 patients with stab ounds had few problems, although 4 deaths occurred as the sult of massive hemorrhage from other organs. The 69 tients with gunshot wounds had more severe liver injuries ith a mortality rate of 20.3%, but only 1 of the 14 deaths ould be attributed to the liver injury itself. Automobile accidents caused 34 of the 41 blunt liver injuries. Sepsis and stoperative hemorrhage were the most common complications, counting for 24 of the 31 deaths in the total series. Resecons for massive liver injury were required in only 10 of the 3 patients. The mortality rate of 10.2% was not a reflection the liver injury alone; no patient with an isolated liver injury ed. Of the 21 deaths due to hemorrhage, only 4 could be tributed primarily to the liver injury. Better results will be en with more rapid diagnosis, correction of hypovolemia, and ntrol of all bleeding sites.

6 PROMETHAZINE PROTECTION IN CARBON TETRACHLORIDE LIVER INJURY: AN ELEC-RON MICROSCOPIC STUDY. *(E.)* Serratoni, F. T. (Dept. th., U. Michigan, Ann Arbor), B. Schnitzer and E. B. Smith. *ch Path* 87(1):46-51, 1969.

lult male Sprague-Dawley rats were divided into 5 groups of animals each: Group 1 received CCl_4 (1 ml/kg) orally; Group received CCl_4 (1 ml/kg) orally and promethazine hydrochlo-e (25 mg/kg) i.p., both with CCl_4 and 3 hr later; Group 3 reved mineral oil (0.5 ml/kg); Group 4 received 2 i.p. injecns of promethazine hydrochloride (25 mg/kg) at 6 and 3 prior to sacrifice; and Group 5 served as controls. Animals re killed 6 hr after CCl_4 administration and 3 hr after the t promethazine injection. Light microscopy revealed no anges in the livers from rats in groups 2, 3, 4, and 5. Livers group 1 showed an occasional large, pale, granular balloon-e cell in the region of the central vein. Electron microscopy atation, scattering, and vesiculation of the endoplasmic reticum in group 1 animals. Animals in group 2 did not show se alterations in the endoplasmic reticulum, although many e ribosomes were present. The free ribosomes, in contrast the scattered ribosomes in CCl_4-treated rats, continued to m geometric patterns of orientation. The dissociative effect promethazine may operate at the level of the endoplasmic iculum.

7 THE LIVER OF RATS FED RIBOFLAVIN-DEFICIENT DIETS AT TWO LEVELS OF PRO-IN. *(E.)* Sugioka, G. (Hosp. Sick Child., Toronto, Canada), A. Porta, P. N. Corey and W. S. Hartroft. *Amer J Path* (1):1-19, 1969.

irty male weanling Wistar rats were fed riboflavin-deficient ts containing 2 levels of protein (10 and 20%) and 30 conls were given diets having similar protein contents but supmented with riboflavin (4 mg%). the lipotrope content of 4 diets was equivalent. At 6, 8, 10, 12 and 14 weeks, mals were sacrificed and the livers subjected to light and electron microscopy and biochemical analyses. Hepatic triglycerides showed a relative increase on the low-protein riboflavin-deficient diet, but no fatty livers or other pathological changes developed. At either protein level, riboflavin depletion thus failed to produce significant alterations in the structural integrity, function, or levels of lipids, proteins and nucleic acids in the liver.

768 EFFECT OF ETHANOL ON RAT LIVER. V. MORPHOLOGICAL AND FUNCTIONAL CHANGES AFTER PROLONGED CONSUMPTION OF VARIOUS ALCOHOLIC BEVERAGES. *(E.)* Kiessling, K. H. (St. Göran's Hosp. Stockholm, Sweden) and L. Pilström. *Quart J Stud Alcohol* 29(4):819-827, 1968.

The effect of various commercial alcoholic beverages on rat liver mitochondria was compared with that of purified ethanol in 7 groups of 30-day-old male Wistar rats given cognac, scotch whiskey, vermouth, white wine, red wine, or 95% ethanol, diluted when necessary to a final concentration of 12-15 %, or water and sucrose isocaloric with the alcoholic beverages. After 150 and 270 days the following studies were done: (a) electron microscopy of the hepatic cells, (b) determination of the specific activities of isocitric dehydrogenase, α-glycerophosphate dehydrogenase, malic dehydrogenase and glyceraldehyde-3-phosphate dehydrogenase, and (c) measurement of glucose metabolism in liver homogenates with or without iodoacetate. After 150 days all alcoholic beverages except white wine had increased the mitochondrial size. After 270 days, however, the mitochondrial sizes had regressed in all groups except the rats given white wine, in which the mitochondria were now enlarged. The mitochondria were either elongated, twisted, oval with disorganized shortened cristae, or enlarged. In groups on distilled alcohol, mitochondrial respiration decreased with pyruvate and succinate as the substrates but not with β-hydroxybutyrate or α-glycerophosphate. Increased mitochondrial respiration was noted with vermouth, white wine and red wine. Oxidative phosphorylation was the same in all groups except when the drinking fluid was diluted ethanol and the mitochondrial substrate was α-glycerophosphate. The liver homogenates from rats given whiskey or vermouth consumed significantly more oxygen in the absence of iodoacetate than those from control rats. A decrease in the activity of hepatic isocitric dehydrogenase was observed in rats given cognac, whiskey and vermouth but not in those given ethanol. These effects are ascribed partly to liver damage and partly to adaptive changes in enzyme composition.

769 THE ROLE OF LIPOPEROXIDATION IN THE PATHOGENESIS OF FATTY LIVERS INDUCED BY PHOSPHORUS POISONING IN RATS. *(E.)* Ghoshal, A. K. (Hosp. Sick Child., Toronto, Canada), E. A. Porta and W. S. Hartroft. *Amer J Path* 54(2):275-291, 1969.

Biochemical and cytologic changes occurring in the first 24 hr of phosphorus intoxication were investigated in 39 male Wistar rats (160-250 g) fasted for 16 hr and given a single dose of yellow phosphorus (0.75 mg/100 g body weight) suspended in mineral oil by gastric intubation. Animals were killed 4, 6, 12 and 24 hr after poisoning. Two other rats received carbon tetrachloride (100 μl/100 g body weight) mixed in equal parts of mineral oil. Four hr after administration of phosphorus there was increased lipoperoxidation in the hepatic microsomal fraction. The hepatic triglycerides remained within normal limits for the first 6 hr but were increased about 5-fold at 12 and 24 hr. Plasma triglyceride levels were lower at 24 hr than at 12, suggesting impairment of triglyceride synthesis. SGOT but not SGPT levels were significantly elevated at 24 hr. At 4 hr, the degree of diene conjugation in the microsomal lipids was significantly lower in phosphorus-treated rats than in CCl_4-treated animals. This is consistent with the finding that the hepatic triglycerides accumulated at a slower rate in phosphorus-treated rats than in CCl_4-treated rats. It is suggested that the phosphorus-induced peroxidative decomposition of hepatic microsomal lipid, as in CCl_4-intoxication, precedes and could be the cause of the abnormal fat accumulation. Early hepatic changes occurred predominantly in the periportal zones, while by 24 hr such changes involved all the zones of the lobules. The earliest ultrastructural change in phosphorus-treated animals, consisting of vesiculation and dispersion of the ribosomal granules in the rough endoplasmic reticulum, was observed at 12 hr. The smooth endoplasmic reticulum also appeared to have participated in the process of vesiculation. By 24 hr, the mitochondria were altered in most hepatocytes. Ribosome-bearing whorls of paired membranes were frequently found in the hepatocytes of phosphorus-intoxicated rats; their meaning remains unclear.

770 **EFFECTS OF HALOTHANE, ETHER, AND CHLOROFORM ON THE ISOLATED, PERFUSED, BOVINE LIVER: A COMPARATIVE STUDY.** *(E.)* Bombeck, C. T. (U. Illinois Coll. Med., Chicago), T. Aoki, E. A. Smuckler and L. M. Nyhus. *Amer J Surg* 117(1):91-107, 1969.

The effects of halothane (H), ether (E) and chloroform (C) on perfusion hemodynamics, carbohydrate metabolism, liver function tests, hepatic ultrastructure, and hepatic microsomal detoxification mechanisms were investigated in the isolated perfused calf liver. Preparation of the calves and the perfusion apparatus are described in detail. None of the agents tested had any effect on hepatic arterial or portal venous resistance. C at 0.5% and 1.5%, but neither H nor E, markedly stimulated bile flow. E (30%) and C (1.5% and 0.5%) depressed O_2 consumption during the period of anesthetic exposure, but O_2 uptake returned to normal during the recovery period; H had no significant effect. E (12% and 30%) and C (0.5% and 1.5%) both produced marked changes in all parameters of carbohydrate metabolism (lactate utilization, glycogen synthesis, hepatic glycogenolysis and/or gluconeogenesis) which were consistent with inhibition of oxidative energy metabolism. H had almost no effect, except that at 3.0% it irreversibly inhibited glycogen synthesis and also inhibited lactate utilization. Both concentrations of E and C stimulated marked SGOT release, but only C caused significant release of potassium from the liver; H produced no significant liver damage as indicated by SGOT or potassium release. Electron microscopy revealed marked proliferation of the smooth endoplasmic reticulum in livers treated with 3% H or 1.5% C; this resembled lesions produced by acute carbon tetrachloride toxicity, chronic phenobarbital administration, or shock. Ribosomal disaggregation was also observed with both agents. None of the agents had any effect on the mitochondria. Like carbon tetrachloride, 3% H (but not 30% E) uncoupled oxidative N-demethylation in the hepatic microsomal fraction. The authors caution against extrapolating the results of these studies to halothane as a clinical anesthetic.

771 **EARLY CHANGES IN PLASMA PROTEINS AFTER ISOLATED IRRADIATION OF THE LIVER.** *(Ger.)* Stähler, F. (Radiobiol. Inst., U. Hamburg, Germany) and G. Otten. *Strahlentherapie* 136(6):718-722, 19

Plasma proteins in male rats were reduced to 27% of their initial level by replacing the blood with a suspension of erythrocytes, washed 3 times in Tyrode's solution to remove plasr proteins, in polyvinylpyrrolidone. About 9 hr after the exchar transfusion half the plasma proteins had been replaced and abc 48 hr after transfusion, 90%. No significant changes were produced in the behavior of the total plasma proteins by irradiati the rats' livers with 1000 and 5000 rads. However, irradiation retarded the increase in albumin concentrations and speeded u the increase in globulin concentrations.

772 **BIOLOGICAL AND HISTOLOGICAL LIVER ANOMALIES ASSOCIATED WITH ORAL CON TRACEPTIVES: NOTE ON THE BEHAVIOR OF THE BILI ACIDS, BSP, AND INDOCYANIN GREEN.** *(Fr.)* Caroli, J. (St. Antoine Hosp., Paris, France), B. Chevrel, M. Rautureau, F. Lemonnier, V. G. Lévy and Y. Hecht. *Path Biol (Paris)* 16(21/22):935-942, 1968.

Four women with histories of jaundice during pregnancy or menstruation were given 20 mg/day Enidrel (norethynodrel + mestranol) for 8 days. Another woman developed severe jau dice after taking Lyndiol (lynestrenol + mestranol) and Norlu (norethindrone). These oral contraceptives produced modera increases in bilirubin and cholesterol in 4 out of 5 cases, but increased alkaline phosphatase in only 2 cases and transamina in 1. All 5 had total bile acids of more than 23 mg/liter. Tl increase was due to an increase in the trihydroxycholanic aci fraction in 4 cases and to an increase in dihydroxycholanic a in the subject with elevated serum transaminase levels. BSP retention at 45 min was 30% or more in 3 cases. Indocyanir green retention was pathological in 1 of the 2 subjects tested and was changed by Enidrel in the other. The only consiste change found in liver biopsies was congestion of the sinusoid Biliary thrombi, characteristic of intrahepatic cholestasis, wer found in only 1 case. Anomalies appeared in the ultrastruct of villi in the bile caniliculi in 1 of the 2 cases in which elect microscope studies were made.

773 **HEPATIC INJURY IN MUSHROOM POISONI ELECTRON MICROSCOPIC OBSERVATIONS ON TWO NONFATAL CASES.** *(E.)* Panner, B. J. (U. Roc Sch. Med., N. Y.) and R. J. Hanss. *Arch Path* 87(1):35-45,

Light and electron microscopy of hepatic tissue obtained by cutaneous needle biopsy from a 44-yr-old man and his 33-yr wife on the third day of illness following nonfatal poisoning *Amanita verna* revealed signs of hepatocellular injury. The clinical course and laboratory data for both patients are pre The most marked changes occurred in parenchymal and Ku cells, predominantly in periportal areas. Small numbers of nuclei and nucleoli showed evidence of injury, including a r duced amount of clumped nucleoplasm, fragments of nucle remnants, enlarged nucleoli and dispersion of nucleolar gran Many hepatic parenchymal cells contained large fat droplets which differed from the usual fatty droplets by the inclusio of fragments of fibrillar material that might be of membran

igin, and occasionally, of finely granular dark material sug-
stive of bile. Fat droplets in Kupffer cells were morphologic-
y unremarkable. The presence of abnormally large amounts
fat in the hepatocytes could result from a disturbance in
e integrity of the cellular protein synthetic mechanism. The
ugh endoplasmic reticulum was generally unchanged in paren-
ymal cells. Several irregular dense bodies of variable size
re seen, consisting of globules of lipid, bits of membrane,
ered mitochondria and dilated cisternae of endoplasmic re-
ulum. These were regions of focal cytoplasmic degradation
lipofuscin bodies related to liposome formation. An unde-
mined number of elongated, sometimes spherical mitochondria
every section studied contained paracrystalline striations.
ctioned longitudinally and transversely, the striations were
served to be tubular rods about 100 A in diameter, separated
100-150 A intervals. Alterations in Kupffer cells included
reased prominence of cytoplasm, decreased width of sinusoidal
nens, and rarely, sinusoidal lining cells showing vacuolization
disruption of mitochondria, vesiculation of cisternae and
of membrane integrity, indicative of cellular necrosis.

FUNCTIONAL AND MORPHOLOGICAL LIVER CHANGES IN WOMEN TAKING ORAL CON-
ACEPTIVES. A CLINICAL AND ULTRASTRUCTURAL
UDY WITH SPECIAL REFERENCE TO THE OCCURRENCE
CHOLESTASIS.

(E.) Pihl, E. (Inst. Path., U. Umea,
eden), O. Rais and E. Zeuchner. *Acta Chir Scand* 134(8):
-650, 1968.

roup of 16 women (18-39 yr old; 11 subsequently operated
for cholelithiasis, 4 with acute abdomen, and 1 with throm-
s) taking Anovlar (norethisterone acetate 4 mg, ethinyl-
adiol 0.05 mg/pill), Conluten (norethisterone 2 mg, mestranol
mg/pill) or Linoral (ethinylestradiol 10 mg/pill) for 6 weeks-
was compared with an unselected group of 12 patients
women, 1 man, 21-64 yr old) operated on for cholelithiasis.
langiography revealed patent biliary ducts in all patients.
t and electron microscopic studies of liver biopsies (taken
peration or percutaneously) revealed polymorphism and
talline structures within the mitochondria in both groups,
ough they were more prominent in the contraceptive group.
groups had similar intracellular bile casts and changes in
canaliculi. Significant elevations of serum bilirubin, SGOT,
T, and SGPT/SGOT ratios were found in the contraceptive
p as compared to the control group. Sulfobromophthalein
(performed only in the contraceptive group) were abnormally
ted in 8 patients (6 with cholelithiasis, 2 with acute ab-
en). It is concluded that contraceptive steroids may have
a primary hepatocellular and a secondary hepatocanalicular
effect.

TOXIC DYSTROPHY OF THE LIVER IN YOUNG CHILDREN.

(Rus.) Nisevich, N. I.
. Pirogov 2nd Moscow Med. Inst., USSR), A. M. Spasibko
M. A. Shalevich. *Pediatriia (Moskva)* 47(11):3-9, 1968.

clinical course and autopsy findings are analyzed for 27
ren, under 2 yr old, with toxic dystrophy of the liver.
course was acute in 7, subacute in 19, and fulminating in
ld who had a history of bronchial asthma and pneumonia.
f the children had serum hepatitis and no history of any
ct with infectious hepatitis patients. The acute form
oped 1-3 days before jaundice appeared and was charac-
d by a coma lasting 2-3 days and ending fatally. All but 2 patients had serum bilirubin levels of 8.5 mg% or lower and elevated aldolase and alanine-aminotransferase levels. The weight of the liver was 30-40% below normal. Except for 2 patients with acute massive necrosis of the hepatic parenchyma, all children with the acute form of toxic dystrophy of the liver had focalized necrosis, resorption of the necrosing hepatic epithelium, collapsed stroma, pronounced capillary plethora, and infiltrates of lymphocytes and histiocytes. Signs of regeneration were seen in 2 cases. All patients with the acute form had marked CNS changes and hemorrhages into almost all of the visceral organs. The subacute form developed 7-8 days before jaundice appeared. Two types of courses were seen: gradually progressive and phasic. In the subacute form the patients had a more pronounced hemorrhagic syndrome, higher serum bilirubin levels (10-18 mg%), lower fevers, and shorter comas. A great variety of liver changes are found in children with subacute toxic dystrophy of the liver.

776 THE EFFECT OF HETEROIMMUNE ANTI-HEPATIC SERUM ON NORMAL DEVELOPMENT IN THE RAT LIVER.

(Rus.) Babaieva, A. G. (Inst. Exp. Biol., Acad. Med. Sci. USSR, Moscow) and N. I. Kuznetsova. *Pat Fiziol Eksp Ter* 12(6):62-64, 1968.

Anti-rat-liver serum from rabbits, with a titer of 1:640 in the complement fixation test, was diluted 1:10, 1:50, 1:250, and 1:1250 with physiological saline and injected into rats of different ages (70-400 g in weight) for 6 consecutive days at a dose of 0.6 ml/kg body weight/day. On the 7th day the rats were sacrificed and their viscera weighed, and mitotic activity in the liver was studied. At a dilution of 1:50, antihepatic serum produced a 35% increase in the weight of the liver in young rats and a 17% reduction in older animals compared to controls. The average increase in liver weight produced by other dilutions of the serum was only 10% in young rats. The same titers of anti-rat-brain serum had no effect on the weight of rat livers. Antihepatic serum had no effect on mitotic activity in the livers of young rats, but significantly inhibited mitosis in older animals. It is suggested that the effects of antihepatic serum on older rats may be due to their own high titers of antihepatic antibodies and to the relatively larger doses they received if doses are calculated on the basis of liver, rather than body, weight.

777 INVESTIGATIONS ON THE EFFECT OF AN ORAL CONTRACEPTIVE AND ITS COMPONENTS ON LIVER FUNCTION, SERUM PROTEINS, COPPER, COERULOPLASMIN AND γ-GLUTAMYL PEPTIDASE IN POSTMENOPAUSAL WOMEN.

(E.) Adlercreutz, H. (Dept. Clin. Chem., U. Helsinki, Finland), A. Eisalo, A. Heino, T. Luukkainen, I. Penttila and H. Saukkonen. *Scand J Gastroent* 3(3):273-284, 1968.

Following administration of 0.15 mg of mestranol and 5 mg of lynestrenol (Lyndiol) daily for 2 weeks to 16 postmenopausal women (61-89 yr old), significant increases in serum transaminases, copper, nonceruloplasmin copper, ceruloplasmin, γ-glutamyl peptidase and α_1-globulins were noted. When treatment with 0.15 mg of the estrogen (mestranol) was continued for another 2 weeks, a significant decrease in serum albumin and γ-glutamylpeptidase was noted as compared with the pretreatment level and the total copper, ceruloplasmin, and α_1-globulin levels continued to increase. When, in another comparable group of 15 subjects, the mestranol and lynestrenol treatment was followed by treatment with 5 mg of the progestogen (lynestrenol) for 2 weeks, the serum albumin did not decrease and the copper, ceruloplasmin, α_1-globulins, and γ-glutamyl peptidase values remained unchanged. It is concluded that the decrease in serum albumin and increases in α_1-globulins, total copper, nonceruloplasmin copper and ceruloplasmin are due to the estrogen component of the contraceptive pill, and that the progestogen component is the primary cause of the increase in serum enzymes. Copper estimation seems to be a good tool for the *in vivo* evaluation of steroid estrogenicity.

778 **CLINICAL AND HISTOLOGICAL STUDY OF 18 CASES OF JAUNDICE ASSOCIATED WITH THE USE OF CONTRACEPTIVE STEROIDS.** *(Sp.)* Amenabar, E. (J. J. Aguirre Hosp., Santiago, Chile), J. P. Dominguez and J. M. Orellana. *Rev Med Chile* 96(6):404-407, 1968.

Jaundice developed in 18 women, aged 23-35 yr, who had been taking daily doses of 4 mg norethynodrel or 5 mg lynestrenol as progestogens and 0.05 mg ethynylestradiol or 0.15 mg mestranol as estrogens. Eight of the 16 patients who had been pregnant had histories of pruritus and jaundice during some or all of their pregnancies. Jaundice developed in the first cycle of therapy in 9 women, but as late as the twelfth cycle in 1 case. In 11 cases jaundice persisted for 2-3 months. It was never associated with hepatomegaly. The total and direct bilirubin were elevated in all cases. SGOT activities ranged from 51-250 U in the 17 cases in which they were determined and SGPT activities were elevated in 12 of 17 cases. The flocculation test was negative in 16 of 18 cases. Prothrombin levels were normal in all 18. Alkaline phosphatase activities were elevated in 16 of 18 cases. Needle biopsies of the liver showed cholestasis, predominantly in the central lobe, in all 18 cases; intracellular pigment in 15 cases; swelling of Kupffer's cells in 18 cases; necrotic cells in 16 cases, with Councilman's bodies in 2; and the presence of inflammatory infiltration of the trabeculae in all cases, with small nodules in 8.

779 **LIVER CHANGES PRODUCED BY EXPOSURE TO DDT (CLINICAL OBSERVATIONS AND AUTOPSY STUDIES).** *(Rus.)* Krasniuk, Ie. P. (Inst. Occup. Hyg. Dis., Kiev, USSR), Ie. I. Makovskaia, M. B. Rappoport and V. M. Paramonchik. *Gig Tr Prof Zabol* 12(12):20-22, 1968.

Since the incidence of liver and biliary tract disease was higher among workers in a DDT plant than among a control group, and was proportional to the length of service, liver function tests were run on 100 of these workers. Urinary excretion of hippuric acid after sodium benzoate loading was impaired in 58 of the 80 studied. Results of galactose loading tests were abnormal in 69 cases, and liver protein synthesis was impaired in more than half of those studied. In 62 of these 100 workers urinary urobilin levels were elevated, but blood bilirubin levels remained normal. Rose Bengal excretion was delayed in more than 33% of those studied. The results of these tests were particularly abnormal in workers with clinical symptoms of hepatitis. The hepatotoxicity of DDT was confirmed by morphological and histochemical changes seen in experimental acute poisoning (animal or animals unspecified). Treatment included glucose-insulin therapy combined with polyvitamins, lipotropic agents, duodenal catheterization, liver diathermy, and a diet rich in cheese and low in cholesterol. Improvement in liver function was noted in all workers except those with toxic hepatitis or hepatocholecystitis who had to be transferred to other work for 6-12 months.

780 **LIVER DAMAGE DUE TO DRUGS.** *(Sp.)* Treviño García Manzo, N. (Natl. Med. Ctr., Mexican Inst. Soc. Security, Mexico City). *Prensa Med Mex* 33(9/10):303-311, 1968.

781 **HEPATOTOXICITY OF CYTOSTATIC DRUGS EVALUATED BY LIVER FUNCTION TESTS AND APPEARANCE OF JAUNDICE.** *(E.)* Robert, J. (Ctr. Tumors, U. Brussels, Belgium), P. Barbier, J. Manaster and E. Jacobs. *Digestion* 1(4):229-232, 1968.

782 **SEQUENTIAL MORPHOLOGIC CHANGES IN AFLATOXIN B_1 CARCINOGENESIS IN THE RAT.** *(E.)* Newberne, P. M. (Massachusetts Inst. Technol., Cambridge) and G. N. Wogan. *Cancer Res* 28(4):770-781, 1968.

783 **INJURIES TO THE HEPATIC ARTERY DURING SURGERY.** *(Ger.)* Akovbiantz, A. (Surg. Clin. A. U. Zurich, Switzerland), B. Messmer, M. Cadalbert and W. Wirth. *Bull Soc Int Chir* 27(4):324-333, 1968.

784 **EFFECT OF ANTIFERTILITY AGENTS ON LIVER AND METABOLIC DISEASES.** *(E.)* Borell, U. *Int J Fertil* 13(4):314-320, 1968.

785 **PATHOHISTOLOGICAL STUDY OF THE MOUSE LIVER FOLLOWING INTRAPERITONE ADMINISTRATION OF VARIOUS AMINES.** *(Jap.)* Nakamur Y. (Fac. Med., Hirosaki U., Japan). *Hirosaki Med J* 20(1):160-175, 1968.

786 **VARIATIONS IN THE CELL CYCLE DURING AZO DYE HEPATOCARCINOGENESIS.** *(E.)* Simard, A. (Inst. Cancer, Montreal, P.Q., Canada), G. Cousinea and R. Daoust. *J Nat Cancer Inst* 41(6):1257-1263, 1968.

787 **THE EFFECT OF HALOTHANE IN THE RAT WITH EXPERIMENTAL OBSTRUCTIVE JAUNDICE.** *(E.)* Pintér, A. (Med. Sch., U. Pécs, Hungary) and M. Tekeres. *Acta Physiol Acad Sci Hung* 34(1/2):117-121 1968.

788 **THE EFFECT OF HYPOTHERMIA ON THIOACETAMIDE-INDUCED HEPATIC DAMAGE.** *(E.)* Molnár, Z. (Med. Sch., U. Pecs, Hungary) and F. Varga. *Acta Physiol Acad Sci Hung* 34(1/2):95-101, 1968.

39 **EFFECT OF GROWTH HORMONE ON HEPATIC CARCINOGENESIS AND CIRRHOSIS IN AxC ATS GIVEN N-2 FLUORENYLDIACETAMIDE.** *(E.)* Reuber, . D. (Natl. Cancer Inst., NIH, Bethesda, Md.). *Cancer Res* (11):2177-2179, 1968.

0 **RENAL AND HEPATIC INJURY ASSOCIATED WITH METHOXYFLURANE ANESTHESIA.** *(E.)* Elkington, S. G. (Yale U. Sch. Med., New Haven, Conn.), J. A. Goffinet and H. O. Conn. *Ann Intern Med* 69(6):1229-1236, 1968.

791 **THE EFFECT OF HALOTHANE ON LIVER DETOXIFICATION PROCESSES.** *(E.)* Bombeck, C. T. (U. Illinois, Chicago), T. Aoki, E. A. Smuckler and L. M. Nyhus. *Bull Soc Int Chir* 27(4):259-267, 1968.

See also: 113,117,118,121,146,158,159,172

792 **AN EVALUATION OF REST AND LOW-FAT DIETS IN THE MANAGEMENT OF ACUTE INFECTIOUS HEPATITIS.** *(E.)* Silverberg, M. (Bronx-Lebanon Hosp. Ctr., Bronx, N. Y.), B. Wherrett, E. Worden and P. Z. Neumann. *J Pediat* 74(2):260-264, 1969.

Of 93 children admitted with acute infectious hepatitis, 49 were placed on a low-fat diet (1 g/kg body weight) and 44 were permitted *ad libitum* fat intake (average 2.3 g/kg body weight). Average daily caloric intake was 1280 calories on the low-fat diet and 1800 calories on the *ad libitum* diet. The average hospital stay was 1 month, and patients were evaluated in the clinic 4 and 12 months after the onset of their illness. Among 32 children with infectious hepatitis seen in the outpatient clinic and not hospitalized, successive patients were alternately advised to observe either bed rest for 2 weeks or free activity as tolerated. After 2 weeks, patients on bed rest were also permitted *ad libitum* activity. No dietary restrictions were recommended in this study, and patients were evaluated 1, 4, and 12 months after the onset of their illness. Children in both paired studies were comparable in age, sex, clinical severity of the disease, and medical history. The convalescence of the 2 groups on the different dietary and activity regimens was identical as judged by serial SGOT determinations and clinical evaluations. It is recommended that children be permitted *ad libitum* activity with supervision during the acute stages of infectious hepatitis, and that they be given a nutritious, fat-as-tolerated diet following the initial period of anorexia.

793 **AUSTRALIA ANTIGEN AND ACUTE VIRAL HEPATITIS.** *(E.)* London, W. T. (Inst. Cancer Res., Fox Chase, Philadelphia, Pa.), A. I. Sutnick and B. S. Blumberg. *Ann Intern Med* 70(1):55-59, 1969.

The Australia antigen (Au (1)) was found in the sera of 20% of 125 patients with acute viral hepatitis and was absent from the sera of 138 patients with other liver diseases (cirrhosis, infectious mononucleosis, hepatoma). There was no significant difference in the distribution of the antigen among males and females; the antigen was not found in any patient less than 19 yr old. With 2 exceptions, it was present in the sera for short intervals (days to weeks). The characteristics of Au (1) in patients with hepatitis differ from those in other groups where Au (1) is present in high frequency (Down's syndrome, leukemia, lepromatous leprosy, and tropical populations), in which persistence of the antigen, a higher frequency in males than females, and a higher frequency in the first 2 decades of life are consistent findings. Host factors related to immunologic competence may be responsible for these differences. The data indicate that Au (1) is not a nonspecific manifestation of liver damage.

794 **INFECTIOUS HEPATITIS IN MEMPHIS-SHELBY COUNTY, TENNESSEE 1952-1967.** *(E.)* Rendtorff, R. C. (U. Tennessee Coll. Med., Memphis), M. Kashgarian and E. W. Fowinkle. *J Tenn Med Ass* 62(2):130-134, 1969.

During a 16-yr period (1952-1967), 2058 cases of infectious hepatitis were reported in the Memphis-Shelby area, consisting of 565 white males, 536 white females, 309 Negro males, and 229 Negro females (corresponding to rates of 22, 20, 22, and 15/100,000 population, resp.). Two major epidemics occurred during this period, the 1st during 1953-1954 and the 2nd (and larger) during 1960-1962. The 2nd epidemic affected chiefly the 5-29-yr-old group with little contribution from the 0-4 and the 50-and-over age groups. Since this epidemic, there has been a relatively higher endemic rate than prior to the outbreak. A seasonal variation was noted with a low during June and July, a constant rate from August to February, and a high rate from March through May. Comparison of the Memphis area's experience with the national and regional experience (data from the National Communicable Disease Center) substantiates that 2 major epidemics occurred with peaks in 1953-1954 and 1960-1962, and that a relatively higher endemic rate has existed since the last outbreak. It is suggested that the expected epidemic wave for 1969-1970 may be relatively minor due to a high degree of immunity in the population as a whole established by this current high level of endemic disease.

795 **TRANSFUSION HEPATITIS: USE OF STATISTICAL DECISION THEORY.** *(E.)* Polissar, J. (Clin. Ctr., NIH, Bethesda, Md.). *Transfusion* 9(1): 9-22, 1969.

Statistical decision theory can be used to extract maximum information from instances of known transfusion hepatitis in order to produce estimates of carrier probability in individual donors. The application of Bayes' Theorem to the estimation of the probability that a given donor is a hepatitis carrier is proposed and a critical cut-off level is described above which prospective donors should be rejected. Various factors in hepatitis epidemiology which complicate the use of this method are discussed. The benefits that could derive from the implementation of statistical decision theory include a uniform quality of blood (since all blood banks could use the same donor exclusio standards), maintainence of a central record keeping facility, more reliable hepatitis reporting, increased availability of data about hepatitis epidemiology, and use of Bayes' Theorem to update the donor carrier proability results of an imperfect laboratory test for hepatitis carrier detection.

796 **AGE-RELATED VARIATIONS IN VIRAL HEPATITIS.** *(Hun.)* Csonka, S. (Distr. Council Hosp., Marcal, Hungary). *Orv Hetil* 109(42):2306-2308, 1968.

797 **VIRAL HEPATITIS FOLLOWING BLOOD TRANSFUSIONS.** *(Sp.)* Beker G. S. (U. Hosp., Caracas, Venezuela), J. Valencia-Parparcen and M. de Gonzále *Prensa Med Argent* 55(27):1286-1287, 1968.

798 **THE SIGNIFICANCE OF CHOLESTASIS FOR THE TREATMENT AND PROGNOSIS OF INFECTIOUS HEPATITIS.** *(Ger.)* Semmler, H. (Distr. Hosp Potsdam, Germany) and W. Mittmann. *Deutsch Gesundh* 23(45):2127-2130, 1968.

799 **NIALAMIDE IN THE TREATMENT OF VIRAL HEPATITIS IN CHILDREN: COMPARATIVE STUDY OF 25 CASES.** *(Sp.)* Argüello P., A. (Fac. Med., Na U., Bogota, Colombia). *Pediatria (Bogota)* 10(2):173-181, 1968.

00 **NEUTRALIZING ANTIBODIES TO ADENOVIRUS IN INFECTIOUS HEPATITIS.** *(E.)* lwen, J. (London Sch. Hyg. Trop. Med., England) and F. ulton. *J Trop Med Hyg* 71(10):247-251, 1968.

01 **THE COURSE AND LONG-TERM PROGNOSIS OF POST-HEPATITIC PATHOLOGY.** *(Bul.)* toianova-Antova, Z. (Distr. Hosp., Plovdiv, Bulgaria), I. sonchev and N. Ruseva. *Suvr Med* 19(9):723-728, 1968.

)2 **CARDIAC LESIONS IN VIRAL HEPATITIS.** *(Fr.)* Marinesco, G. (Infect. Dis. Hosp., Bucharest, omania), M. Radulesco and I. Dumitresco. *Bull Acad Nat ed* 152(24/25):406-413, 1968.

)3 **BEHAVIOR OF THE RIVANOL (ETHACRIDINE) FRACTIONS OF THE ALANINE AND ASPARTIC CID TRANSAMINASES IN VIRAL HEPATITIS.** *(Pol.)* ymanska, H. (2nd Clin. Intern. Dis., Szczecin, Poland), H. rsiewicz and Z. Nenycz-Grabcowa. *Przegl Lek* 24(10):753-5, 1968.

4 **IMMUNITY IN VIRAL HEPATITIS EVALUATED ON THE BASIS OF EPIDEMIOLOGICAL RITERIA.** *(Rum.)* Constantinescu, N. (Inst. Hyg., Iasi, mania), I. Buzdugan, O. Zavate and I. Manta. *Stud Cercet ramicrobiol* 19(5):347-353, 1968.

5 **GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY, INFECTIOUS HEPATITIS, ACUTE MOLYSIS, AND RENAL FAILURE.** *(E.)* Phillips, S. M. Pennsylvania Hosp., Philadelphia) and N. P. Silvers. *Ann ern Med* 70(1):99-104, 1969.

NON-PRODUCTION OF INTERFERING SUBSTANCES BY SERUM FROM PATIENTS WITH FECTIOUS HEPATITIS. *(E.)* Taylor, P. E. (London Sch. . Trop. Med., England) and A. J. Zuckerman. *J Med robiol* 1(2):217-219, 1968.

ERRORS IN THE DIAGNOSIS OF INFECTIOUS HEPATITIS. *(Rus.)* Matiashin, I. M. (Donetsk . Inst., USSR) and L. S. Bondarev. *Klin Khir (Kiev)* (11): 0, 1968.

808 **VIRAL HEPATITIS AND HEPATIC COMA.** *(Ser.)* Bobinac, E. (Med. Ctr., Doboj, Yugoslavia). *Lijecn Vjesn* 90(6):527-534, 1968.

809 **INFECTIOUS HEPATITIS ASSOCIATED WITH MALIGNANT TUMORS AND SYSTEMIC DISEASES.** *(Fr.)* Gavrila, I. (Clin. Infect. Dis., Cluj, Romania), N. Opreanu and R. Ardeleanu. *J Med Montpellier* 3(5):224-228, 1968.

810 **HEPATITIS AS A WORLD PROBLEM.** *(E.)* Mosley, J. W. (Commun. Dis. Ctr., U.S. Dept. HEW, Atlanta, Ga.) and M. A. Kendrick. *Bull NY Acad Med* 45(2):143-163, 1969.

811 **THE NATURAL HISTORY OF HEPATITIS.** *(E.)* McCollum, R. W. (Yale U. Sch. Med., New Haven, Conn.). *Bull NY Acad Med* 45(2):127-137, 1969.

812 **INFECTIOUS HEPATITIS IN MILITARY POPULATIONS: PROBLEMS ENCOUNTERED WITH GAMMA GLOBULIN PROPHYLAXIS.** *(E.)* Conrad, M. E. (Walter Reed Army Inst. Res., Washington, D. C.). *Bull NY Acad Med* 45(2):167-180, 1969.

813 **GAMMA GLOBULIN PROPHYLAXIS.** *(E.)* Krugman, S. (New York U. Sch. Med., N. Y.). *Bull NY Acad Med* 45(2):181-188, 1969.

814 **THE TREATMENT OF HEPATITIS.** *(E.)* Sherlock, S. (U. London, England). *Bull NY Acad Med* 45(2):189-200, 1969.

815 **DISCUSSION OF THE PAPER BY SHEILA SHERLOCK: "THE TREATMENT OF HEPATITIS".** *(E.)* Eisenmenger, W. (Cornell U. Med. Coll., New York, N. Y.). *Bull NY Acad Med* 45(2):201-210, 1969.

816 **HEPATITIS AND LEUKEMIA: THEIR RELATION TO AUSTRALIA ANTIGEN.** *(E.)* Blumberg, B. S. (Inst. Cancer Res., Philadelphia, Pa.), A. I. Sutnick and W. T. London. *Bull NY Acad Med* 44(12):1566-1586, 1968.

See also: 201,202,232,259,775

817 **PRIMARY BILIARY CIRRHOSIS: IMMUNOGLOBULINS IN SURGICAL APPRAISAL.** *(E.)* Block, M. A. (Henry Ford Hosp., Detroit, Mich.), G. A. LoGrippo and T. A. Fox Jr. *Amer J Surg* 117(1):69-77, 1969.

Determination of serum immunoglobulins by micro-double diffusion on an agar slide revealed elevated IgG, IgM, and IgA levels in 4 women (32-61 yr old) with primary biliary cirrhosis. The case histories of these patients are presented. Although serum immunoglobulins may be elevated in other chronic intrahepatic diseases and elevations are not specific for distinguishing between intrahepatic disease and extrahepatic biliary tract obstruction, persistent elevation of serum immunoglobulins can aid in diagnosing primary biliary cirrhosis, even if cholelithiasis, is also present. As demonstrated in these 4 patients, corticosteroid therapy usually produces a reduction in the serum immunoglobulin level but does not significantly change the course of the underlying disease. A review of the histories of 21 women (including the above 4) and 1 man with primary biliary cirrhosis diagnosed during a 15-yr period showed that 10 had associated cholelithiasis, which confused the diagnosis and treatment of the intrahepatic disease. Cholecystectomy was performed in 9, but 7 of these died of progressive hepatic disease within 8 yr and the other 2 had persistent jaundice. Of the whole 22, 18 died within 2-21 (average 6) yr after diagnosis, including 15 of liver failure and 3 of hemorrhagic esophageal varices. Although cholecystectomy is justified in these patients, it does not halt the progress of the intrahepatic disease or prevent death.

818 **TOTAL BODY COMPOSITION IN CIRRHOTIC PATIENTS WITH METABOLIC ALKALOSIS, HYPOKALEMIA, HYPERAMMONIEMIA, AND PORTACAVAL SHUNT.** *(E.)* Kukral, J. C. (U. Illinois Coll. Med., Chicago), J. M. Brandly, B. A. Fritsch, N. Stefanovic, and G. C. Henegar. *Amer J Surg* 117(1):85-90, 1969.

In a study of the role of hypokalemic alkalosis in hepatic coma, determinations of serum electrolytes, blood pH, ammonia, and CO_2 were made in 112 cirrhotic patients. Alkalosis was present in 25%. The total body water level and sodium space were significantly elevated and the potassium space was depressed in 10 cirrhotic patients with alkalosis. Replacement of potassium reversed the alkalosis and the associated coma. Portacaval shunts had no beneficial effect on the abnormalities in total body composition found in these patients.

819 **EFFECT OF PREDNISONE ON THE SURVIVAL OF PATIENTS WITH CIRRHOSIS OF THE LIVER.** *(E.)* Tygstrup, N. (State Hosp., Copenhagen, Denmark), S. B. Andersen, T. Balslev, M. Bjorneboe, V. Faber, S. Gjorup, B. Harvald, K. Iversen, O. Jessen, E. Juhl, H. E. Jorgensen, A. R. Krogsgaard, K. Nielsen, S. A. Norregaard, T. S. Olsen, H. Poulsen, F. Quaade, L. Ranek, F. Raaschou, K. Schmith and P. Winkel. *Lancet* 1(7586):119-121, 1969.

The survival of 169 randomized, prednisone-treated (10 mg/day minimum dose) cirrhotic patients was compared with that of 165 cirrhotics not treated with prednisone. The average age (60.1 yr), sex distribution (58% males, 42% females) and the treatment of fluid retention, coma, bleeding, infection, etc. were standardized and parctically identical in the 2 groups. None of the differences between the 2 groups were statistically significant. The overall death-rates were the same in the 2 groups, but when female patients without ascites were considered alone, the death-rate of the prednisone-treated patients was significantly lower. In patients with ascites, however, prednisone seemed to increase the death-rate. Further analysis of these data will provide a more precise basis for selecting patients with cirrhosis for glucocorticoid treatment.

820 **EFFECT OF A FLAVONOID ON THE CAPILLARY RESISTANCE OF THE RECTAL MUCOS IN HEPATIC CIRRHOSIS.** *(E.)* Wild, C. (Med. Fac., U. Lausanne, Switzerland) and J. Fasel. *Amer J Proctol* 20(1): 60-63, 1969.

In 22 patients with severe hepatic cirrhosis (confirmed by live function tests and biopsy), the capillary resistance of the rectal mucosa was measured both prior to and 1 week after treatment with O-(β-hydroxyethyl)-rutosid (HR), given p.o. at a dosage of 400 mg 3 times daily. Measurements of capillary resistance were made by applying a constant negative pressure of 1 m H_2O through a Lister proctoscope passed to a distanc of 10 cm from the anal verge, and observing the time necessa to produce mucosal petechiae. The mean time interval was 8 sec before treatment and was 11 sec after treatment with HR The positive action of HR is important since capillary fragilit is one of the factors involved in edema formation and mucos hemorrhages in patients with severe hepatic insufficiency.

821 **THE SOURCE OF ALBUMIN IN THE THORA DUCT LYMPH IN PATIENTS WITH PORTAL HYPERTENSION AND ASCITES.** *(E.)* Boyer, J. L. (Inst. Postgrad. Med. Educ. Res., Calcutta, India), W. C. Maddrey, A. K. Basu and F. L. Iber. *Amer J Med Sci* 257(1):32-43, 1969.

The transfer of ^{131}I-labeled albumin from plasma and ascite fluid to thoracic duct lymph was investigated in 7 male patients with ascites and portal hypertension (5 with cirrhos and 2 with extrahepatic portal obstruction). Ascites fluid albumin gained access to the thoracic duct lymph before it could be detected in the plasma. Plasma albumin appeared thoracic duct lymph more rapidly than did ascites fluid albumin. A significantly greater fraction of the thoracic du albumin was derived from plasma than from ascites fluid. I is concluded that while much of the ascites fluid albumin leaves the peritoneum via the thoracic duct, it contributes f less to the albumin content of thoracic duct lymph than d plasma.

822 **END TO SIDE VERSUS SIDE TO SIDE PORT CAVAL SHUNTS IN PATIENTS WITH HEPA CIRRHOSIS.** *(E.)* Turcotte, J. G. (U. Michigan Med. Ctr., Ann Arbor), V. W. Wallin Jr. and C. G. Child 3rd. *Amer J Surg* 117(1):108-116, 1969.

The results of surgery in 44 patients who had side-to-side shunts and 58 who had end-to-side shunts for bleeding vari secondary to portal or postnecrotic cirrhosis were compare after follow-up of up to 8 yr. Patients ranged from 4 to 8 yr of age with a mean of 49; there were 68 males and 34 f males. Emergency operations were performed in 25 cases.

<, and degree of risk, based on hepatic reserve as determined
clinical and laboratory tests, were distributed almost evenly
iong the patients receiving end-to-side shunts and those re-
iving side-to-side shunts. The operative mortality was 29%
: the entire group and increased with decreasing hepatic re-
ve, it was slightly higher for all patients with end-to-side
ınts, but this difference was significant only in the high-risk
oup. Patients with confirmed portal cirrhosis had an opera-
e mortality almost twice that of patients with confirmed
stnecrotic cirrhosis. The operative mortality was 3 times as
h among patients undergoing emergency operations as among
ose who had elective surgery. The cumulative probability of
vival was 30% for the entire series. When analyzed for both
k and type of shunt, patients with side-to-side shunts had a
tter prognosis. The cause of death was gastrointestinal
morrhage in 35% and hepatic coma in 27% of the operative
aths. Liver failure accounted for 50% of the late deaths.
ronic encephalopathy developed in 14 patients, 9 of whom
l side-to-side shunts. The incidence of other postoperative
mplications was about equal in both groups. These findings
licate that the side-to-side portacaval shunt should be preferred
the poor-risk patient because of a significantly lower opera-
e mortality.

3 A COMPUTER BASED INDEX FOR THE PREDICTION OF OPERATIVE SURVIVAL IN TIENTS WITH CIRRHOSIS AND PORTAL HYPERTEN- ON.

(E.) Siegel, J. H. (Albert Einstein Coll. Med., New York,
Y.) and J. B. Williams. *Ann Surg* 169(2):191-201, 1969.

e detailed mathematical and statistical techniques used to
elop indices of physiologic correlation suitable for computer
luation of cardiovascular data from critically ill patients are
cribed. To develop these indices (Vascular Tone, Effective
ygen Transport, Relative Peripheral Shunting, and Ventricular
nction), assessment-oriented programs designed for use with
Programma 101 (a relatively inexpensive digital computer)
re employed. The indices, normalized with respect to the
an values for control patients and patients in hyperdynamic
tic and nonseptic shock, make it possible to locate a given
ient's physiologic status with respect to each of the given
diovascular functions. Based on the evaluation of 44 patients
h hepatic cirrhosis and portal hypertension prior to proced-
s for portal decompression, a Survival Index was quantified
ich relates the abnormalities in peripheral circulation to the
el of myocardial capacity. Previous work has indicated that
prognosis of portal decompression in such patients is worse
he presence of a hyperdynamic cardiovascular state resemb-
that in septic shock. The Survival Index permitted the pre-
rative division of cirrhotic patients into 3 groups with dif-
ent probabilities of operative survival: >90%, 50% and <20%.
e physiologic interpretation of this index is broadly that
cirrhotic patients an increasing degree of peripheral arterio-
ous shunting requires increased myocardial capacity in order
allow survival. Use of the Survival Index has permitted better
diction of operative prognosis than any other currently used
ex of liver function. None of the 17 deaths were in the
up of 17 patients with positive Survival Indexes, while 9 of
with a 50% chance of survival and 8 of 10 with very low
exes died.

CHRONIC COLITIS IN THE AETIOPATHOGENESIS OF CIRRHOSIS OF THE LIVER. *(E.)*

Kasliwal, R. M. (S. M. S. Med. Coll., Jaipur, India), V. S. Baldwa, B. M. Sharma and M. L. Sharma. *Amer J Proctol* 19(6):405-410, 1968.

The role of enterocolonic infections in the etiology of hepatic cirrhosis was investigated in 30 patients with gastrointestinal complaints (chronic diarrhea, dysentery with remissions and exacerbations) and associated cirrhosis of the liver. Patients were divided into 2 groups: group A (12 patients) had amebiasis with secondary bacterial infection (*E. coli* in 10, *Klebsiella aeruginosa* in 2); group B (18 patients) had colonic infections but no amebiasis (*E. coli* in 12, *Paracolobacter* in 4, *Alkaligenes faecalis* in 1, and *Pseudomonas* in 1). In group A, the titer of agglutinating antibodies varied from 1:4 to 1:64. Electrophoretic studies revealed that group A had serum globulin levels in the 25-45% range while group B included a greater percentage of cases with a higher globulin content (6 cases with globulins over 45%). Colonic biopsies revealed inflammatory changes varying from mild (slight erosion of the lining epithelium) to marked (aggregations of inflammatory cells in the intraglandular stroma as well as in the submucosa). Liver biopsies revealed early (focal, scattered cell damage, reticulum condensation, Kupffer cell hyperplasia, mononuclear cell hyperplasia) to advanced changes (marked disorganization of the hepatic architecture with regenerative activity, fibrous tissue infiltrated with chronic inflammatory cells). Group A patients had mainly mild changes, while in group B 2 patients had advanced and 16 had early changes. Liver function studies revealed only slight derangement in group A and moderate to marked derangement in group B. It is therefore thought that endotoxemia has a direct damaging effect on the hepatocytes, liberating hepatic antigen against which autoantibodies form resulting in continuing hepatic cellular damage which eventually progresses to cirrhosis of the liver.

825 SEX HORMONES AND SUSCEPTIBILITY OF THE RAT TO DIETARY CIRRHOSIS. *(E.)*

Patek, A. J. Jr. (Columbia U. Coll. Phys. Surg., New York, N. Y.), E. Erenoglu, N. M. O'Brian and R. L. Hirsch. *Arch Path* 87(1):52-56, 1969.

Ninety Sprague-Dawley rats (23 males, 23 castrated males, 21 females, and 23 castrated females) were fed a cirrhosis-producing diet, low in choline and protein. Liver biopsies were taken after 2 months on the experimental diet, and all animals were killed after 4 months when liver samples were again taken for histologic study. Male rats developed the most severe hepatic changes; 17 showed fibrotic changes, and in 9 these were advanced. In the castrated male and intact female rats, hepatic fibrosis was moderate in frequency and severity. Minimal hepatic changes were observed in castrated females: 13 had no hepatic fibrosis, and only 2 showed advanced cirrhotic lesions. This study confirms the impression that male rats are more susceptible than female rats to dietary cirrhosis, and suggests that female hormones also predispose the rat to cirrhosis, although less effectively than the male hormone.

826 CHANGES IN THE INTRAHEPATIC BILE DUCTS IN COMMON FORMS OF CIRRHOSIS: THEIR ANATOMICAL AND HISTOGENETIC SIGNIFICANCE.

(Fr.) Camilleri, J. P. (Fac. Med., Paris, France), J. Diebold and T. Caulet. *Actualites Hepatogastroent Hotel Dieu* 4(4):B139-B152, 1968.

Biliary tracts from 12 patients with septal cirrhosis, 4 with postnecrotic cirrhosis, and 3 with normal livers were studied by radiology following injection of radio-opaque material, preparation of casts following injection of plastic (Rhodopas) in an acetone solution, or injection of India ink followed by graphic reconstruction of serial sections. Changes were found in the smallest branches, including hyperplasia of the small portal canals, the appearance of noncommunicating pseudotubular structures resulting from the regression of canals in the hepatic trabeculae, and the development of intrascleral networks communicating with the bile ducts which probably resulted from the proliferation of pre-existing ductules. The biliary tree enlarged greatly along with the development of sclerosis, disintegration of the parenchyma into nodules, and the appearance of vascular intrascleral networks perfused selectively by the hepatic artery. This hyperplasia was associated with deep-seated dystrophic changes in pre-existing and newly formed biliary canals. Similar, but very intense changes were seen in postnecrotic cirrhosis. In atrophic cirrhosis the lesions involved large portal canals and segmentary canals.

827 **SUPRADIAPHRAGMATIC TRANSPOSITION OF THE SPLEEN IN PORTAL HYPERTENSION.** *(E.)* McClelland, R. N. (U. Texas Southwest. Med. Sch., Dallas) and F. A. Bashour. *Arch Surg* 98(2):175-179, 1969.

The effect of supradiaphragmatic splenic transposition on survival and the severity of ascites and portal hypertension was studied in dogs with experimental portal hypertension of two types. The mean crude survival time for 26 control animals with superior-hepatic vein constriction was 14 days compared to 48 days in 22 dogs with splenic transposition. Survival was prolonged even more significantly by splenic transposition when ascites was prevented. In a second group of 10 control dogs with 80% occlusion of the supradiaphragmatic-inferior vena cava, the incidence of massive ascites was 80% about 2 weeks after the operation compared to 50% in 14 animals in which splenic transposition had been performed an average of 138 days before. Combined data from dogs with partial hepatic outflow occlusion of either type showed that persistent ascites developed in only 18 of 34 (53%) with splenic transposition compared to 20 of 22 controls. Portal pressure remained elevated (199 mm H_2O) in 90% of animals without splenic transposition, but was reduced to normal in 50% of animals with splenic transposition. Relief of portal pressure was not related to the presence or absence of ascites, except coincidentally. Splanchnic venography also demonstrated that the presence of ascites was not related to the size of portasystemic venous collaterals mediated through the spleen.

828 **THE INDUCTION OF LIVER CIRRHOSIS IN RATS BY PURIFIED AMINO ACID DIETS.** *(E.)* Newberne, P. M. (Dept. Nutrit. Food Sci., Massachusetts Inst. Tech., Cambridge), A. E. Rogers, C. Bailey and V. R. Young. *Cancer Res* 29(1):230-235, 1969.

Male weanling Fischer rats (4 weeks old) were fed lipotrope-deficient or control diets using purified amino acids as the source of dietary essential and nonessential amino acids. The amino acid mixtures were based on the composition of casein or on amino acid diets previously shown to result in normal growth in rats. Livers from deficient rats were fatty after 10 weeks and cirrhotic after 4 months to 1 yr. Liver lipids reached a maximum of 69% of the dry weight, with triglyceride accounting for the bulk of the increase; however, cholesterol was also significantly increased while the phospholipid content remained unchanged. The serum levels of all 3 lipid fractions decreased in the deficient rats. These findings are in agreement with the results of lipotrope deficiency in rats fed intact protein. DNA synthesis in parenchymal cells, measured by emulsion autoradiographs from rats given thymidine-^{3}H, increased in fatty livers and then returned to normal as cirrhosis progressed. Chemical and morphological changes indicated that fatty nutritional cirrhosis (characteristic of lipotrope deficiency and identical to that induced with intact proteins) was induced with the L-amino acid diets. The severity of the lesions and the time of onset were more consistent than is found with deficient diets containing intact proteins. L-Amino acid diets should be particularly useful in assessing the effect of fatty nutritional cirrhosis on the induction of liver damage by hepatic carcinogens and further eliminate the uncertainty of possible unknown contaminants in intact proteins.

829 **BLOOD BILIRUBIN AND CHOLESTEROL LEVELS IN RATS WITH ACUTE FATTY DYSTROPHY (STEATOSIS) AND CIRRHOSIS OF THE LIVER INDUCED BY LONG-TERM CHOLINE DEFICIENCY AND ETHIONINE.** *(Rus.)* Sergeieva, K. V. (Inst. Nutrit., Acad. Med. Sci. USSR, Moscow). *Vop Pitan* 27(5):23-26, 1968.

Fatty dystrophy and cirrhosis of the liver were induced in rats either by feeding them a choline-deficient diet with a corn or peanut base or a diet containing 0.25% ethionine for 4.5-11 months. These animals all had high blood levels of indirect bilirubin and cholesterol. Liver changes were prevented and indirect bilirubin and cholesterol levels kept within normal limits by addition of choline to the choline-deficient diet or 0.8% DL-methionine to the ethionine-containing diet.

830 **THE PATHOPHYSIOLOGICAL BASIS FOR A RATIONAL DIURETIC TREATMENT OF CHRONIC DECOMPENSATED CIRRHOSIS OF THE LIVER.** *(Ger.)* Schnack, H. (1st Med. Clin., U. Vienna, Austria). *Wien Klin Wschr* 80(39):721-725, 1968.

831 **CARDIORESPIRATORY ABNORMALITIES ASSOCIATED WITH GASTROESOPHAGEAL HEMORRHAGE IN CIRRHOSIS.** *(E.)* Del Guercio, L. R. M. (Albert Einstein Coll. Med., New York City). Pp 34-39 in *Progress in Gastroenterology,* Vol 1 Glass, G. B. J., Ed. New York, Grune and Stratton, 1968. 520 pp.

832 **ALTERATIONS IN THE K AND Na CONCENTRATIONS OF THE SALIVA, SERUM AND URINE BEFORE AND AFTER ADMINISTRATION OF SPIRONOLACTONE, ALONE OR IN COMBINATION WITH A THIAZIDE DERIVATIVE IN PATIENTS WITH CIRRHOSIS OF THE LIVER.** *(Gr.)* Konkouris, L. (Path. Clin. B, Aristotelian U. Salonika, Greece), A. Litos and E. Panagiotopoulos. *Galenos* 10(7/8):315-328, 1968.

833 **THE ROLE OF THE SPLEEN IN THE PATHOGENESIS OF EXPERIMENTAL HEPATIC CIRRHOSIS.** *(Ger.)* Streicher, H. J. (Surg. Clin., U. Marburg/Lah Germany) and H. Hartung. *Bull Soc Int Chir* 27(4):345-352, 1968.

34 **THE CLINICAL CHARACTERISTICS OF HEPATIC CIRRHOSIS IN ARGENTINA.** *(Sp.)* Ieeroff, M. (Prof. Dr. G. Araoz Alfaro Polyclin., Lanus, uenos Aires, Argentina), B. Feldfeber, L. Pinchuk, Al Alicino, . Cestoni, B. Bekier, S. Aschkenazy and N. Exposito. *Medicina Mex)* 48(1049):632-639, 1968.

35 **THE THERAPEUTIC EFFECTS OF ORNITHINE α-KETOGLUTARATE IN LIVER DISEASE.** *(Fr.)* rexinos, J. (Purpan Hosp., Toulouse, France), J. P. Pascal nd A. Ribet. *Rev Med* 9(25):1651-1662, 1968.

36 **THIOACETAMIDE INDUCED LIVER CIRRHOSIS IN RATS. I. LIGHT MICROSCOPIC OBSERVA-IONS.** *(E.)* Kendrey, V. G. (U. Med. Sci., Budapest, Hungary). *xp Path* 2(5):295-304, 1968.

37 **BANTI'S DISEASE CONSIDERED AS A MORBID ENTITY.** *(E.)* Suzuki, T. (Osaka City U. Med. ch., Japan). *Bull Soc Int Chir* 27(4):338-344, 1968.

38 **SURGICAL TREATMENT FOR INTRACTABLE ASCITES.** *(E.)* Mortenson, R. A. (Iowa City, wa) and R. L. Lawton. *Amer J Surg* 116(6):929-932, 1968.

839 **THE ARCUS VENOSUS EPIPLOICUS MAGNUS AS A COLLATERAL CIRCULATION IN HEPATIC CIRRHOSIS.** *(Ger.)* Schmitt, W. (Anat. Inst., U. Wurzburg, Germany), E. Wüstenfeld, H. Braun and L. Pippig. *Z Gastroent* 25(5):356-360, 1968.

840 **THE EFFECT OF AZATHIOPRINE ON THE BIOLOGICAL CHARACTERISTICS OF ALCOHOLIC LIVER DISEASE.** *(Fr.)* Fossati, P. (Med. Clin. East, Lille, France), A. Racadot, J. Lefebvre, M. Decoulx and M. Linquette. *Lille Med* 13(8):876-879, 1968.

841 **BILIARY CIRRHOSIS IN CHILDREN.** *(Fr.)* Hoeffel, J. C. *Med Infant* 75(7):517-538, 1968.

842 **CIRRHOSIS IN CHILDREN.** *(Fr.)* Bocquet, L. (Hosp. Sick Child., Paris, France) and C. Nezelof. *Med Infant* 75(7):493-515, 1968.

843 **EFFECT OF ETHACRYNIC ACID ON DIURESIS, ELECTROLYTE EXCRETION AND RENAL FUNCTION IN PATIENTS WITH CIRRHOSIS OF THE LIVER.** *(Turk.)* Kocak, N. (Med. Fac., U. Istanbul, Turkey) and E. Ozdogan. *Turk Tip Cem Mec* 34(8):502-510, 1968.

See also: 173,312,704

844 **HEPATIC PLEXUS VAGECTOMY AS AN ADJUNCT TO CHOLECYSTECTOMY.** *(E.)* Schein, C. J. (Montefiore Hosp., Bronx, N. Y.), T. C. Beneventano, R. G. Rosen, H. M. Dardik and M. L. Gliedman. *Surg Gynec Obstet* 128(2):241-255, 1969.

Hepatic plexus vagectomy as a therapeutic and prophylactic approach to postcholecystectomy biliary stasis was investigated in 64 dogs and 15 patients treated for cholecystitis. In dogs, selective hepatic plexus vagectomy immediately lowered the passage pressure across the choledochoduodenal junction by an average of 33.9%. Passage pressure was not further reduced by additional division of the celiac branch of the right vagus nor by bilateral infradiaphragmatic or complete supradiaphragmatic truncal vagectomy or administration of atropine. The procedure did not affect the size or distensibility of the common bile duct, the competence or contractile function of the choledochal sphincter, the volume of hepatic bile, or hepatic artery or portal vein blood flow. Pilocarpine restored choledochal pressure almost to prevagectomy levels. Hepatic plexus vagectomy immediately reduced the passage pressure by 21.1-43% (average 32.1%) in all 15 patients, including 7 with normal and 8 with significantly elevated passage pressures. Three patients with severe acute cholecystitis attained the most marked pressure reductions (59.5, 61.5 and 84%), and the final average postoperative reduction in choledochoduodenal passage pressure was 42.3%. Eight patients demonstrated elevated pain tolerance to acute duct dilatation. Postoperative liver function tests and barium studies of the esophagus, stomach and duodenum revealed no abnormalities. Six to 12 months postoperatively none of the patients showed symptoms relative to the biliary tract. Since hepatic plexus vagectomy facilitates bile drainage and helps reduce or eliminate bile stasis, it may have prophylactic value in conjunction with cholecystectomy.

845 **A NEW HYDROPHILIC POLYMER AS A COMMON DUCT REPLACEMENT.** *(E.)* Levowitz, B. S. (Jewish Hosp. Med. Ctr., Brooklyn, N. Y.), J. LaGuerre and W. S. Calem. *Arch Surg* 98(2):251-255, 1969.

Plastic cylinders (2.5 cm long with a cross-sectional diameter of 2.5 mm and wall thickness of 0.5 mm) prepared from the biologically nonreactive, conductive hydrophilic polymer Hydron were implanted as cholecystoduodenal or segmental choledochal prostheses in 2 and 14 dogs, resp. Exploratory operations and cannulation for cholangiography were performed on all survivors 7-9 months after implantation. Both dogs with cholecystoduodenal prostheses died within 6 weeks, probably because fibrous tissue failed to grow into the Teflon felt sheath, leading to inadequate fixation with subsequent peritonitis. Thirteen of 14 animals with common duct substitutes survived more than 6 months; 5 were still living 10-15 months after implantation and showed no clinical signs of hepatic, biliary or digestive dysfunction. Two animals which died at 8 and 10 months, resp., with jaundice, marked dilatation of the ductal system and cholangitis revealed granulation tissue blocking the lumen of the implant. Histologic examination of liver tissue from 5 long-term survivors demonstrated normal hepatic cell structure Operative cholangiograms of 8 animals with prostheses implanted for more than 7 months indicated considerable dilatation of the bile ducts proximal to the implant. The encouraging survival rate in this series attests to the compatibility of the bile-plastic interface.

846 **THE HARMLESSNESS OF LEAVING A LONG CYSTIC STUMP AFTER CHOLECYSTECTOMY**
(Fr.) Champeau, M. (Corentin-Celton Hosp., Lille, France), M. Arsac and R. Alvarez. *Rein Foie* 11:43-52, 1968.

Examination of 700 cholangiograms made during cholecystect
omy showed that the stump of the cystic duct was longer tha
1 cm in 119 cases. Of the 94 patients who could be followe
none had any symptoms which could be attributed to this lo
stump. It is concluded that undetected residual biliary diseas
is the true cause of the postcholecystectomy syndrome.

847 **RELATIONS BETWEEN GALLBLADDER CAR**
CINOMA, CHOLELITHIASIS, AND CHOLECYSTITIS. *(Ger.)* Rissel, E. (Rudolf Found. Hosp., Vienna, Austria) and A. Streubel. *Z Gastroent* 6(5):375-381, 1968.

Among 7885 autopsies performed during a 6.5-yr period, 178
revealed signs of gallbladder disease; of these 1782 patients, 1
had carcinomas of the gallbladder, while the largest number h
chronic cholecystitis, cholelithiasis or both. About 2/3 of th
group were women, and the peak incidence age was 60-80 yr
regardless of sex or the presence or absence of stones. Carcinomas were also found in 20 (4 men and 16 women) of 17
patients (44 men and 1302 women) who had their gallbladde
surgically removed for other reasons. It was confirmed that
gallbladder carcinoma occurs predominantly among females a
among the elderly. No evidence was found to support the h
pothesis that cholelithiasis produces carcinoma of the gallbla

848 **COMMON DUCT EXPLORATION IN ACUTE CHOLECYSTITIS: REVIEW OF 100 CONSEC**
TIVE CASES. *(E.)* Hilton, H. D. (Lincoln, Neb.) and W. T. Griffin. *Surgery* 65(2):269-270, 1969.

The incidence of common duct stones was investigated in 10
patients (30 males and 70 females, 14-87 yr old, average 58
with acute cholecystitis in whom common duct exploration
was indicated by jaundice, multiple small stones in the gallbladder, edematous pancreatitis, a dilated common bile duct
and/or cholangitis. Stones were recovered in 54 patients, 6
of whom had stones which were predominantly multiple an
small, while 37% had medium or large stones. Pancreatitis
encountered in 27 patients and was associated with commo
duct stones in 15. There were 24 dilated common ducts an
13 contained stones, but stones were also found in 50% of
common ducts of normal size. Thirty-three patients manife
severe cholangitis, and 13 of these had calculi. Twenty-nin
were currently jaundiced and 18 related prior episodes of ja
dice. The incidence of postoperative complications (10%)
no higher in cholecystectomy with common duct exploratio
than in cholecystectomy without common duct exploration
the 2% mortality was also comparable.

849 **SURGICAL TREATMENT OF BILIARY ATR**
(E.) Kasai, M. (Tohoku U. Sch. Med., Sendai,

Japan), S. Kimura, Y. Asakura, H. Suzuki, Y. Taira and E. Ohashi. *J Pediat Surg* 3(6):665-675, 1968.

Among 87 proven cases (31 males and 56 females, 2-14 months old) of biliary atresia, there were 20 'correctable' types (obstruction of the distal choledochus with choledochus cyst in 6, obstruction of the proximal choledochus in 2, and obstruction of the hepatic duct with moderately dilated proximal ducts in 12) and 67 'incorrectable' types (obstruction of the hepatic duct with hypoplastic proximal ducts in 27, rudimentary hepatic duct or absent duct in 33, and undefined type in 7). Among 16 infants with 'correctable' types in which an anastomosis between the biliary tract and the intestine was performed, 8 showed excellent excretion of bile after operation and 3 were completely cured, while the remainder had impairment of bile excretion and no bile was excreted in 3. There were 7 operative deaths and the remaining 9 died 1-6 months after operation. Among 53 infants with 'incorrectable' types who underwent hepatic portoenterostomy, bile excretion was excellent in 11, fair in 9, and poor or none in 32. There were 14 postoperative deaths and 32 deaths 1 month-3.5 yr after surgery, while 6 patients were alive, without jaundice, 22 months-13 yr after operation. Among the cases in which procedures other than hepatic portoenterostomy were performed, there were no long-term survivors. All survivors in both the 'correctable' and 'incorrectable' types were operated on before 4 months of age. It is concluded that 'correctable' cases of biliary atresia are not necessarily curable, whereas some cases of 'incorrectable' types might be cured by hepatic portoenterostomy if the operation is performed before 4 months of age.

850 **CHANGES IN THE GALLBLADDER EPITHELIUM IN CHOLECYSTITIS.** *(Rus.)* Derizhanova, I. S. (Rostov-on-Don Med. Inst., USSR). *Arkh Pat* 30(10):52-57, 1968.

Sections from 23 gallbladders with signs of acute cholecystitis and 24 with chronic cholecystitis were studied histologically and histochemically. Dystrophic and necrobiotic changes, most evident in fibrinous and suppurating forms of acute cholecystitis, resulted in a marked reduction of mucoid secretion and destructuration of the epithelial layer. These changes are due to circulatory disturbances and exudation in underlying connective tissue. In chronic cholecystitis these changes were often associated with mucosal sclerosis and hyalinization. Proliferative changes consisted of 1) proliferation of the superficial epithelium, 2) infiltration of epithelium into underlying connective tissue, and 3) proliferation of layers in regeneration. Mucous glands developed in the walls of tubular ducts during infiltrative proliferation, producing adenomatous hyperplasia of the mucosa which was often associated with smooth muscle hyperplasia. Proliferation of layers occurred in acute cholecystitis and at the edge of ulcers formed by the pressure of stones. Epithelial metaplasia is considered to be a compensatory mechanism since transformation of epithelial cells into mucosal and goblet cells resulted in increased mucus secretion, protecting the mucosa from the action of bile acids. Epithelial dedifferentiation and the appearance of juvenile cell forms were seen in all 3 types of proliferation, but particularly in regeneration when underlying connective tissue was sclerotic and hyalinized.

851 **A STUDY OF SYMPTOMATIC AND "SILENT" GALLSTONE.** *(E.)* Bouchier, I. A. D. (Royal Free Hosp., London, England), K. Rhodes and M. Brien. *Scand J Gastroent* 3(3):299-304, 1968.

The clinical features of 17 consecutive patients (11 females and 6 males, 34-68 yr old) undergoing cholecystectomy for gallsones were compared with those of 14 consecutive patients (5 females and 9 males, 29-78 yr old) in whom gallstones were an incidental finding at postmortem examination. The sera of the cholecystectomized patients were examined for gallbladder tissue antibodies. The gallstones from these cases, 9 additional cholecystectomized patients and 3 more postmortem cases were examined for their number, size, and histamine content. The only relevant symptoms in the postmortem group were right upper quadrant pain in 6 (43%), and anorexia, nausea and vomiting in 5 (36%). These symptoms were present in the cholecystectomized group in 15 (88%) and 6 (35%) cases, resp. Specific antibodies to gallbladder tissue could not be demonstrated in the patients with gallbladder disease. No conclusions could be drawn as to what determines whether or not a stone becomes symptomatic.

852 **CHOLEDOCHAL OBSTRUCTION DUE TO HYDATIDOSIS.** *(Sp.)* Schieppati, E. *Prensa Med Argent* 55(28):1335-1337, 1968.

853 **EARLY REOPERATIONS FOLLOWING BILIARY SURGERY.** *(Fr.)* Olivier, C. (Tenon Hosp., Paris, France). *J Chir (Paris)* 96(3):249-258, 1968.

854 **BENIGN STENOSIS OF THE HEPATIC DUCT: AN ANALYSIS OF 18 PERSONAL CASES.** *(Fr.)* Toader, C., M. Ghibu and I. Toader. *J Chir (Paris)* 96(3):193-206, 1968.

855 **RESULTS OF THE SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS.** *(Fr.)* Rogister, G. (Surg. Clin. B, U. Liege, Belgium) and A. Cops. *Rev Med Liege* 23(18):558-559, 1968.

856 **TWO CASES OF INTESTINAL OBSTRUCTION DUE TO GALLSTONES.** *(Pol.)* Batko, B. (Milit. Hosp., Gliwice, Poland). *Wiad Lek* 21(18):1649-1651, 1968.

857 **ADENOMYOMA OF THE AMPULLA OF VATER.** *(Por.)* Falcão, D. (Neves Pinto Hlth. Ctr., Maceio, Alagoas, Brazil) and A. Teixeira Leal. *Folha Med* 57(3):335-344, 1968.

858 **ANATOMICAL, CLINICAL AND RADIOLOGICAL FINDINGS IN THE HYPERPLASTIC CHOLECYSTOSES (ADENOMYOMA AND ADENOMYOMATOSIS OF THE GALLBLADDER).** *(It.)* Cosmacini, G. (Maggiore Hosp., Milan, Italy). *Minerva Gastroent* 14(2):60-70, 1968.

859 **RADIOLOGICAL FINDINGS IN THE CHOLECYSTOSES.** *(It.)* Costa, F. (Maggiore Hosp., Milan, Italy). *Minerva Gastroent* 14(2):52-59, 1968.

860 **THE SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS.** *(Pol.)* Dabrowski, W. (Munic.

Hosp., Tomaszow Mazowiecki, Poland). *Pol Przegl Chir* 40(10): 1086-1091, 1968.

861 **ERRORS AND DANGERS IN OPERATIONS ON THE HEPATIC DUCT AND COMMON BILE DUCT.** *(Rus.)* Smirnov, Ie. V. (S. M. Kirov Acad. Milit. Med., Leningrad, USSR) and V. S. Mzhel'skii. *Khirurgiia (Moskva)* 44(8):36-42, 1968.

862 **CAUSES OF MORTALITY FROM ACUTE CHOLECYSTITIS.** *(Rus.)* Uglov, F. G. (All-Union Sci.-Res. Inst. Pulm., Min. Health USSR, Leningrad), Ie. K. Seleznev and I. P. Savinov. *Khirurgiia (Moskva)* 44(8): 29-32, 1968.

863 **CALCIFICATION OF THE GALLBLADDER.** *(Fr.)* Dubarry, J. J., A. Quinton, M. Fahimi and M. Le Bras. *Gaz Med France* 75(30):6019-6028, 1968.

864 **CICATRICIAL STENOSIS OF THE HEPATIC DUCT: ONE CASE WITH A HEPATICOJEJUNOSTOMY WHICH HAS BEEN FUNCTIONING FOR 14 YEARS.** *(It.)* Pelloja, M. (Inst. Gen. Surg. Clin., U. Florence, Italy). *Omnia Med* 46(1):95-140, 1968.

865 **A CASE OF DISTOMIASIS OF THE COMMON BILE DUCT.** *(Fr.)* Nini, W. (Tripoli, Libya), I. Assouad and N. Nini. *Bull Soc Int Chir* 27(4):306-309, 1968.

866 **CHOLECYSTOSIS.** *(Sp.)* Ibarguen Beitia, S. (Acad. Med. Sci., Bilbao, Spain). *Rev Esp Enferm Apar Dig* 27(8):1161-1194, 1968.

867 **CANCER OF THE COMMON BILE DUCT WITH PULMONARY METASTASES.** *(Fr.)* Gramatopol, D. ("August 23rd" Distr. Hosp. Adults, Bucharest, Romania). *J Radiol Electr* 49(11):826, 1968.

868 **ADENOMYOMATOSIS OF THE GALLBLADDER.** *(Sp.)* Salvioli, J. E. (Fac. Med. Sci., U. La Plata. Buenos Aires, Argentina) and R. De Marco. *Rev Esp Enferm Apar Dig* 27(8):1195-1206, 1968.

869 **BILIOENTEROSTOMY IN REOPERATIONS ON THE EXTRAHEPATIC BILE DUCTS.** *(Fr.)* Stefanini, P. (2nd Gen. Surg. Clin., U. Rome, Italy) and M. Ermini. *Chir Gastroent* 2(3):366-371, 1968.

870 **THE SURGICAL TREATMENT OF STRICTURES OF THE HEPATIC DUCT AND COMMON BILE DUCT.** *(Ger.)* Smirnov, E. (Leningrad, USSR). *Bull Soc Int Chir* 27(4):253-258, 1968.

871 **COMPRESSION OF THE TERMINAL CHOLEDOCHUS BY LYMPH NODES RESULTING IN AN ERRONEOUS INDICATION FOR SPHINCTEROTOMY.** *(It.)* Lago, T. F. (Inst. Spec. Surg. Path., U. Pavia, Italy). *Chir Gastroent* 2(3):283-292, 1968.

872 **VISUALIZATION OF THE GALLBLADDER AND THE BILIARY TRACT IN THE ABSENCE OF A SPHINCTER OF ODDI.** *(E.)* Persyko, L. (Hotel Dieu Hosp., Kingston, Ont., Canada), B. Colwell and I. T. Beck. *J Canad Ass Radiol* 29(3):140-142, 1968.

873 **ACUTE ACALCULOUS CHOLECYSTITIS.** *(E.)* Hilton, H. D. (Lincoln, Neb.) and W. T. Griffin. *Surgery* 64(6):1047-1048, 1968.

874 **PRIMARY ADENOCARCINOMA IN A CYSTIC DUCT STUMP: REPORT OF A CASE AND REVIEW OF THE LITERATURE.** *(E.)* Phillips, S. J. (Maimonides Med. Ctr., Brooklyn, N. Y.) and J. Estrin. *Arch Surg* 98(2):225-227, 1969.

875 **ACUTE CHOLECYSTITIS IN THE DIABETIC.** *(E.)* Turner, R. J. III. (Charity Hosp., New Orlea La.), W. F. Becker, W. O. Coleman and J. L. Powell. *Southern Med J* 62(2):228-231, 1969.

876 **BILE DUCT ATRESIA.** *(Ger.)* Herzog, B. (Pediat. Clin., U. Basel, Switzerland). *Helv Chir Acta* 35(5):515-525, 1968.

877 **AGE AS A FACTOR IN MORTALITY AFTER CHOLECYSTECTOMY.** *(E.)* Shelby, E. A. (UCLA Sch. Med., Los Angeles, Calif.) and P. H. Lorhan. *Anesth Analg (Cleveland)* 47(6):733-736, 1968.

878 **THE CONNEXION BETWEEN CALCIUM CONTAINING GALLSTONES, CHOLECYSTITI AND STASIS.** *(E.)* Bergman, F. (Dept. Pathol., U. Umea, Sweden), W. van der Linden and H. Moell. *Acta Hepatosplen* 15(5):326-331, 1968.

879 **EXTRAHEPATIC BILIARY ATRESIA: FURTH COMMENTS ON POTENTIALLY OPERABLE CASES.** *(E.)* Danks, D. M. (Royal Child. Hosp., Victoria, Australia), A. M. Clarke, P. G. Jones and P. E. Campbell. *J Pediat Surg* 3(5):584-592, 1968.

880 **GALLSTONE HEMORRHAGE AND GALLSTO ILEUS.** *(E.)* Koszalka, M. F. (VA Ctr., Fargo, N. D.). *J Lancet* 88(10):279-281, 1968.

881 **FOLLOW-UP STUDY OF 118 PROCEDURES I THE TREATMENT OF THE COMMON DUCT.** *(E.)* Harjola, P. T. (Kemi Cent. Hosp., Finland) and P. Keton *Ann Chir Gynaec Fenn* 57(3):303-306, 1968.

882 **CONGENITAL ABSENCE OF THE GALLBLADDER AND CYSTIC DUCT: A REVIEW OF THE LITERATURE AND REPORT OF A CASE.** *(E.)* Sanders, G. B. (Touro Infirm., New Orleans, La.), T. Flores and P. Arriola. *Amer Surg* 34(10):750-754, 1968.

See also: 133,210,212,213,218,248,275,301,307,362,415,639,673

33 **SUBPHRENIC ABSCESS: A CONTINUING HAZARD.** *(E.)* Sherman, N. J. (Ohio State U.
ll. Med., Columbus), J. R. Davis, and J. E. Jesseph. *Amer
'urg* 117(1):117-123, 1969.

nong 130 patients (79 men and 51 women, 15-84 yr old)
:h subphrenic abscesses treated between 1951 and 1967,
3 (81%) developed abscesses postoperatively and 22 (19%)
l undergone no previous operations; 112 patients had one
cess, 17 had 2, and one had 3. The mortality for the entire
up was 40% (only 24% for the 96 patients whose abscesses
re drained surgically and 85% for the 34 whose abscesses
re not drained). Among surgical patients the incidence of
phrenic abscesses was highest after operations on the stomach
l duodenum. A correct diagnosis was established in only
f the 22 nonsurgical patients and their mortality was 60%.
significant differences were found in the pulse, febrile
ction, white-blood count, radiographic findings, or mortality
ween the group as a whole and the 25 patients who re-
ved antibiotics before or during surgery. The most reliable
iological method of diagnosis was diaphragmatic fluoroscopy
ch was normal in only 22% of patients with abscesses. Chest
ay suggested the possibility of disease in the upper quadrants.
racic signs were on the same side as the abscess in more than
% of cases. The organisms most commonly cultured were
herichia coli (38%), *Staphylococcus aureus* (32%), and
ptococcus (15%). Of 33 abscesses found at autopsy, 10
e inadequately drained and 23 had not been diagnosed.
y 6 of 17 patients with 2 abscesses survived (35%). Al-
ugh 7 abscesses ruptured and 8 developed spontaneous
ılas, only 3 of these patients died (30%), showing that
nage is the most critical factor in determining survival.

**DETERMINATION OF FAECAL BLOOD-LOSS AFTER COMBINED ALCOHOL AND SODIUM
ETYLSALICYLATE INTAKE.** *(E.)* Bouchier, I. A. D.
yal Free Hosp., London, England) and H. S. Williams.
cet 1(7587):178-180, 1969.

possible effects of alcohol (equivalent to 142 ml of 40%)
a buffered solution of sodium acetylsalicylate (728 mg in
cc water plus 209 mg NaHCO, and 1297 mg sodium citrate,
6.7), separately or together, on fecal blood loss were studied
2 normal male volunteers using a double-blind technique
^{51}Cr-sodium chromate (150 μC) to label the erythrocytes.
8 of the 22 subjects tested, there was no detectable bleed-
after the ingestion of either alcohol or sodium acetylsalicy-
there was no significant difference between control and
hol plus drug, between control and alcohol plus placebo, or
veen alcohol plus placebo and alcohol plus drug. The in-
sed blood loss seen in 4 subjects was attributed to bleeding
orrhoids, self-administered codeine for relief of cold symp-
s, and severe vomiting in 3 cases, all unrelated to either
hol or tablet ingestion. Another patient showed increased
ding on the last 2 days of the experiment; no reason was
idated for this phenomenon. The findings were consistent
the concept that this preparation provides sufficient buf-
g capacity to maintain gastric pH at a level at which acetyl-
ylate absorption fails to occur, and therefore there is no
-induced gastric mucosal injury leading to bleeding.

DESMOID TUMORS OF THE ANTERIOR ABDOMINAL WALL. *(E.)* Brasfield, R. D. (Mem. Hosp. Cancer & Allied Dis., New York, N. Y.) and T. K. Das Gupta. *Surgery* 65(2):241-246, 1969.

The 38 patients admitted with abdominal wall desmoid tumors during the period 1931-66 included 29 (76.3%) females and 9 (23.6%) males; the high preponderance of females is statistically significant. A majority (68.4%) of the tumors were in patients between the ages of 20 and 40. Only 3 of the patients were Negroes. The tumor arose in relation to the rectus abdominis muscle and its sheath in 18 (47.3%) patients, while in 8(21%) the linea alba was the site of the tumor. In 6 patients the occurrence of the tumor could be definitely related to the 2nd pregnancy, and in 2 others it could be indirectly related. In 6 other cases, the tumor arose in surgical scars. Wide 3-dimensional excision is the only adequate method of treatment, but histologic examination of the lines of resection is advised before surgical closure of the operative defect is made. The tumor in females may arise on the basis of an unhealed injury to the abdominal wall sustained during pregnancy.

886 **ACID-BASE DISTURBANCES IN MESENTERIC OCCLUSION.** *(E.)* Robertson, G. S. (Aberdeen Royal Infirm., Scotland), A. D. Lyall and J. G. C. Macrae. *Surg Gynec Obstet* 128(1):15-20, 1969.

Measurements made before, during and after occlusion (130 min average) of the superior mesenteric artery in 14 dogs showed that release aggravates the metabolic acidosis normally seen in anesthetized dogs. This change is associated with a decrease in arterial blood pressure, an increase in portal and systemic venous potassium, and, occasionally, a decrease in arterial oxygen pressure. The sytolic blood pressure declined from a mean decrease of 5 mm Hg during occlusion to a mean decrease of 32 mm Hg within 1 min after release of the clamp, and then to 48 mm Hg within 20 min. It is suggested that acid-base changes may be a factor in the production of cardiovascular instability following release of such occlusion.

887 **PAGOPHAGIA AND IRON LACK.** *(E.)* Coltman, C. A. Jr (Wilford Hall USAF Hosp., Lackland Air Force Base, Tex.) *JAMA* 207(3):513-516, 1969.

Pagophagia, defined as the purposeful ingestion of at least 1 ordinary tray of ice daily over a period of more than 2 months, was found in 25 women in association with a clear lack of iron. This lack was caused by hypermenorrhea (22), pregnancy (1) or subtotal gastrectomy (2). Although not all were frankly anemic, all responded by a refusal to ingest ice within 1-14 days after the start of oral or parenteral administration of iron. Since all patients responded before there was any real change in hemoglobin values, the precise relation between pagophagia and iron-lack is not clear. It is postulated that pagophagia may be related to mucosal cytochrome levels.

888 **INTESTINAL CAPILLARIASIS: A NEW DISEASE IN MAN.** *(E.)* Whalen, G. E. (U. S. Naval Med. Res. Unit 2, Taipel, Taiwan, China), G. T. Strickland, J. H. Cross, E. B. Rosenberg, R. A. Gutman, R. H. Watten, C. Uylangco and J. J. Dizon. *Lancet* 1(7584):13-16, 1969.

A newly discovered species of roundworm, *Capillaria philippinensis,* caused an epidemic of severe, often fatal diarrhea in Northern Luzon in 1967. This parasite is the first species of

Capillaria found to infect the human intestine and the first to infect man in epidemic proportions. More than 1000 cases with over 100 deaths were confirmed. Studies on 11 cases are reported in detail. Patients with intestinal capillariasis presented with abdominal pain, diarrhea, muscle wasting, and edema, often leading to debility and death in 2-4 months. Clinical studies demonstrated the presence of a severe protein-losing enteropathy and malabsorption of fats and sugars. Effective treatment consisted of fluid and electrolyte replacement and prolonged antihelminthic therapy with thiabendazole.

889 LEUKOCYTE ALKALINE PHOSPHATASE IN BACTERIAL INFECTIONS OF THE INTESTINE.

(Ger.) Šrámková, L. (Pediat. Fac., Charles U., Prague, Czechoslovakia), J. Lasovská and L. Seidler. *Med Klin* 63(42):1674-1677, 1968.

Leukocyte alkaline phosphatase activity was determined in 27 patients with typhoid fever, 32 with other type of salmonellosis, 31 with Shigella infections, and 48 with diarrhea of undetermined etiology. Alkaline phosphatase values were elevated with the onset of symptoms and decreased gradually during convalescence in patients with *Shigella* infections. In salmonellosis the activity of this enzyme only increased temporarily between 3 and 6 days after the onset of symptoms. In uncomplicated typhoid fever alkaline phosphatase activities were normal on discharge from the hospital (at the earliest 7 days after symptoms developed). Later they increased moderately in a few patients and significantly in 3 patients with uncomplicated typhoid fever who developed secondary infections (maxillary periostitis, periodontitis, and otitis media) during convalescence and in 9 other patients who developed complications (intestinal bleeding, myocardial damage) or secondary infections. In patients with diarrhea of unknown etiology alkaline phosphatase activities increased in patients with symptoms of dysentery and remained low in those suspected of having viral infections. Regression analysis showed that there is a significant correlation between the absolute number of granulocytes and the erythrocyte sedimentation rate among patients with *Shigella* infections and those with salmonellosis. There was no correlation between the leukocyte alkaline phosphatase activity and the absolute number of neutrophils in any of the 4 groups of patients.

890 CONTRIBUTION TO THE ETIOLOGY AND PATHOGENESIS OF INTESTINAL INTUSSUCEPTION.

(Rus.) Lebedev, A. P. (Minsk Distr. Hosp., USSR). *Sovet Med* 31(10):55-60, 1968.

Intussuceptions were found in 409 of 2609 patients (15.6%) with intestinal obstruction. A cause could be established in 79%, while in the other 21% intussuception is assumed to have been caused by dyskinesia due to disorders in local innervation or corticovisceral control. Patients were of all ages and included 61 infants and 8 patients over 70 yr. Males made up 59.7% and females 40.3%. The cause of intussuception in the ileocecal region was cecal mobility in almost 50% and appendicitis in 28.4%. Intussuception in other parts of the intestine was due to intestinal parasites, fecaliths, foreign bodies, inflammation, Meckel's diverticulum, polyps, tumors, alcohol-induced dietary deficiencies, trauma, abdominal operations, peptic ulcers, and other diseases. More than 1 cause was implicated in 5.6%. Four illustrative case reports are presented.

891 EFFECT OF SOME STIMULATORS OF REGENERATION ON THE HEALING OF SURGICAL WOUNDS OF THE GASTROINTESTINAL TRACT IN CHILDREN (EXPERIMENTAL AND CLINICAL TRIALS).

(Rus.) Bilich, G. L. (Munic. Clin. Hosp. Children No. 1, Karaganda, USSR). *Klin Khir (Kiev)* (11):22-27, 1968.

In preliminary experiments, 277 white rats, aged 15-18 days, were subjected to laparotomies and dissection of the anterior wall of the stomach. Starting 3 hr after surgery, 100 mg/kg body weight/day of pentoxyl was given orally to 88 rats and the same dose of 4-methyluracil to 103 rats. The scar was significantly stronger in treated rats after 7 days. Histological studies were made of the surgical field, liver, and spleen 3, 5, and 7 days after surgery. In contrast to control animals, 3 days after surgery animals treated with pentoxyl had completely epithelized defects, smaller areas of damage, and more clearly defined inflammatory infiltrates with more cellular elements. Inflammatory changes in the serous covering were less pronounced. Larger amounts of RNA were present in the cytoplasm of the glandular epithelium of the stomach and of the cells in the inflammatory infiltrate than in controls. Similar changes were seen in rats given 4-methyluracil. By the 7th day after surgery the gastric mucosa had almost completely healed in treated animals, but the defect in the stomach wall was not always completely closed in controls. More than 200 children undergoing abdominal surgery were given instillations of 30-100 ml of 0.75% 4-methyluracil with 0.25% procaine i.p., and 1000-2000 units/ml neomycin 3 times a day for 3-4 days after surgery. None of these children developed complications or inflammation in the abdominal cavity. In addition to speeding up healing, these agents made it possible to remove the sutures earlier.

892 ASYMPTOMATIC PAROTID GLAND ENLARGEMENT IN DIABETES MELLITUS. *(E.)*

Davidson, D. (New Mount Sinai Hosp., Toronto. Ontario, Canada), B. S. Leibel and B. Berris.. *Ann Intern Med* 70(1): 31-38, 1969.

Case reports are presented for 14 patients with diabetes and 2 with borderline glucose tolerance tests who were noted to have asymptomatic parotid gland enlargement. There were 9 men and 7 women, 48-83 yr old. Gland enlargement preceded the recognition of diabetes in 5 patients, and in 4 of these 5 diagnosis depended only on glucose tolerance tests. Sialograms in 3 patients were normal, and histologic examination of 3 parotid glands revealed fatty infiltration. Although the pathogenesis of parotid gland enlargement in diabetes is not clear, a search for diabetes should be made in all patients presenting with this sign.

893 RESPONSE OF HYPERLIPEMIC SUBJECTS TO CARBOHYDRATES, PANCREATIC HORMONES AND PROLONGED FASTING.

(E.) Friedman, M. (Mt. Zion Hosp. Med. Ctr., San Francisco, Calif.), R. H. Rosenman and S. O. Byers. *J Clin Endocr* 28(12):1773-1780, 1968.

The responses of mildly hyperlipidemic subjects (hyperprebetalipoproteinemia) to fasting for up to 38 hr and to administration of glucose, fructose, insulin with and without glucose, tolbutamide and glucagon were studied in 11 healthy male volunteers. Fasting for up to 38 hr did not further lower the ordinary fasting (overnight) plasma triglyceride levels of these ubjects, nor could the latter be lowered by administration of lucose. The usual postprandial hyperlipidemia occurring in nese subjects after a fat meal could be significantly diminished y the administration of either glucose or fructose, but not by isulin, tolbutamide or glucagon. These results confirm the view nat this type of hyperlipidemia is chiefly endogenous in origin.

394 POST-THYMECTOMY WASTING DISEASE AND INTESTINAL BACTERIAL FLORA. *(E.)*

herman, J. D. (Framingham Union Hosp., Mass.) and M. 'urner. *Arch Path* 87(1):29-34, 1969.

study of post-thymectomy wasting disease in AL strain olden hamsters of both sexes indicated that the disease is ssociated with the usual intestinal bacterial flora, both qualatively and quantitatively, an absolute lymphocytopenia and ccasional intestinal crypt lesions; it is not associated with γ-lobulin deficiency, a mild reduction in lymphocytes or a parcular type of intestinal organism. Administration of succinylılfathiazole or sulfaguanidine in the drinking water was effecte in preventing wasting disease in thymectomized hamsters, hile an 8% incidence occurred in neomycin-treated animals nd a 14% incidence was found in tetracycline-treated and nonntibiotic-treated thymectomized animals. There was a good orrelation between the number of intestinal organisms cultured nd the presence of wasting disease. It is suggested that the ormal intestinal flora might produce crypt lesions and diarrhea thymectomized animals with reduced lymphocyte counts.

95 EFFECT OF HYPERBARIC OXYGEN ON EXPERIMENTAL INTESTINAL OBSTRUCTION.

.) Hopkinson, B. R. (Dept. Surg., State U. New York, Buffalo) d W. G. Schenk Jr. *Arch Surg* 98(2):228-232, 1969.

x dogs with large-bowel obstruction (sigmoid colon occluded th a ¼-inch flat silk tape pulled into a snare device) and 6 gs with small-bowel obstruction (produced by complete divin of the terminal ileum) were treated with 100% O_2 at 2 nospheres absolute for 2 hr/day 5 days a week beginning 2-5 ys after surgery. Five of 9 control dogs but only 2 of 6 ated dogs with large-bowel obstruction died of peritonitis thin 14 days. The remaining 4 treated dogs survived until led, 3 requiring additional surgery to maintain the obstrucn. At postmortem examination the colons were found to loaded with increasingly solid feces; the small intestine was rmal. The 6 control and 6 treated animals with small-bowel struction all died, but purulent peritonitis was not a significant se of death (average survival time 19.8 and 18.5 days, resp.). th groups were marked by severe weight loss (10.4 and 10.8 resp.) and extensive fatty changes in the liver; one of the 12 s showed signs of intestinal reconstitution. Abdominal X-ray dies revealed abnormal gaseous distension for a few days after gery in dogs with either small- or large-bowel occlusion. se findings suggest that constipation alone is not lethal and t hyperbaric O_2 treatment might be of value for the treatnt of gaseous distension in paralytic ileus.

5 HYPERBARIA IN EXPERIMENTAL BILE PERITONITIS.

(E.) Nora, P. F. (Northwestern Med. Sch., Chicago, Ill.), J. J. Bransfield and H. Laufman. *h Surg* 98(2):235-238, 1969.

attempt was made to correlate intraperitoneal oxygen tension survival rate in 20 dogs which were subjected to gallbladder fundectomy and omentectomy to induce bile peritonitis and placed in a hyperbaric chamber at 1 or 3 atmospheres absolute (ATA) of 100% oxygen for 2 hr. Ten untreated control dogs with gallbladder fundectomies and 10 dogs in which the abdominal wall was closed without drainage during oxygen treatment all died within 72 hr (average of 44 hr and 30 hr, resp.). Four antemortem and 4 postmortem cultures of peritoneal fluid were positive for *Clostridium perfringens.* In contrast, when the abdominal incision was left open during oxygen therapy, 6 of 10 dogs survived with no apparent ill effects up to 7 days after surgery. The 4 which died lived for 24, 48, 72 and 72 hr, resp.; 2 postmortem cultures were positive for *C. perfringens.* Cultures taken from survivors at the time of sacrifice were all negative. Regardless of whether the abdominal wound was closed or open, arterial blood oxygen tensions were consistently increased about 7-fold at 1 ATA of 100% O_2 and about 25-fold at 3 ATA. The intraperitoneal oxygen tension showed no increase at 1 ATA and a 3-fold increase at 3 ATA in animals with closed abdomens, but rose 4-fold and 17-fold, resp., in animals with open wounds. These results demonstrate that marked elevations in oxygen tension in the peritoneal cavity are beneficial in preventing the lethal effects of experimental bile peritonitis, probably due to their inhibitory effect on anaerobic bacteria.

897 STUDIES ON THE INTESTINAL FLORA. I. THE BACTERIAL FLORA OF THE GASTROINTESTINAL TRACT IN HEALTHY AND ACHLORHYDRIC PERSONS.

(E.) Drasar, B. S. (St. Mary's Hosp. Med. Sch., London, England), M. Shiner and G. M. McLeod. *Gastroenterology* 56(1):71-79, 1969.

The types and distribution of bacteria in the saliva, stomach contents, small intestinal juice, and feces of normal people and in the stomach contents and small intestinal juice of patients with achlorhydria were examined. Samples were collected with a Shiner tube, a Cantor tube, and a Rapid Transit tube. Bacteria were identified by colony morphology, Gram stain, and catalase reaction; aerobic bacteria were distinguished from anaerobes by the use of an agar shake culture. Samples of saliva from 132 normal subjects yielded streptococci, Neisseria, Veillonella, fusobacteria, Bacteroides, and bifidobacteria (10^2-10^6/g saliva) in all samples. Lactobacilli were present in 91.5%, yeasts in 26%, enterobacteria in 26%, and staphylococci in 11.3%. The gastric juice from 42 fasting normal subjects yielded no bacteria (pH below 3 in all cases), but yeast was present in 5. After a meal, the total number of intestinal bacteria isolated fell sharply with time; samples were sterile 60 min after the meal. Seventeen of 25 samples from the upper small intestine of fasting normal subjects were sterile; after a meal, 2 of 5 subjects continued to have sterile upper small intestine samples while in 3, a variety of organisms were found but disappeared within 90 min after the meal. In 6 fasting normal subjects, the bacterial count of the lower small intestine increased as the terminal ileum was reached; Bacteroides and bifidobacteria were present in the largest numbers. After a meal in 1 subject, the bacterial count of the lower small intestine decreased for up to 109 min, then began to reestablish itself. The feces of 25 normal subjects contained Bacteroides and bifidobacteria, which constituted 99% of the cultivable bacteria. Gastric juice from 5 subjects with gastric achlorhydria, yielded large numbers (10^6/g) of enterobacteria, streptococci, and Bacteroides; the upper small intestine was sterile in only 3 of 10 fasting achlorhydric subjects, and contained mixed organisms for up to 90 min (when sampling ceased) after a meal in 1 subject. The lower small intestine of 1 fasting achlorhydric subject contained enterobacteria, enterococci, Bacteroides, and bifidobacteria (10^2-10^5/g).

898 **THE TREATMENT OF DIGESTIVE INSUFFICIENCY.** *(Ger.)* Gietz, E. (Munic. Hosp., Neustadt a.d. Weinstrasse, Germany) and K. Peter. *Z Gastroent* 25(5):335-341, 1968.

For 4-36 weeks, 45 patients with various digestive disorders (25 men and 20 women, 18-76 yr old) were given 6 tablets/day of Pancreflash, usually 2 tablets 10-20 min before meals. These tablets consist of an outer coating of cellulose acetate phthalate, a flash layer of sodium carbonate and citric acid, one core of 0.2 g pancreatin and 0.01 g bile, and a second core of 0.1 g enzymes from *Aspergillus oryzae*. Patients included 3 with gastrectomy-induced dumping syndrome; 19 with pancreatic disorders; 19 with gallbladder diseases and gastritis; 4 with nutritional disorders; and 1 with tumor-induced cachexia. Good to very good results were obtained in all 3 patients with dumping syndrome, in 15 of the 19 with pancreatic insufficiency, in 14 of the 19 with gastritis and gallbladder diseases, and in all 4 patients with nutritional disorders. Treatment was moderately successful in 9 other cases and failed only in the patient with cachexia. No side effects were seen.

899 **A SURGICAL APPROACH TO DIABETES MELLITUS.** *(E.)* LeVeen, H. H. (Brooklyn VA Hosp., N. Y.), C. A. Diaz, V. A. Piccone Jr., G. Falk and B. A. Borek. *Amer J Surg* 117(1):46-54, 1969.

Assays run on 5 nondiabetic patients showed that insulin levels in the portal vein were 3-4 times higher than those in a systemic artery. Therefore, an attempt was made to prevent destruction of insulin in the liver by redirecting pancreatic venous flow from the portal into the systemic circulation in pancreatectomized dogs. Reduced carbohydrate tolerance was induced in dogs by surgical removal of 85-90% of the duodenal portion of the pancreas. Blood glucose levels then increased from normal values to 300 mg% or more. To prevent the development of fatal insulin deficiency, pancreatectomy was combined with ligation of the base of the splenic artery, nephrectomy, and a splenorenal venous shunt. Flat blood glucose curves were obtained, even if glucose was given i.v., and blood insulin levels correlated well with blood glucose concentrations. Although increases in serum cholesterol and phospholipid levels occurred in some animals after creation of a shunt, the increase was not as large as after induction of severe diabetes; in 1 case there was a decrease. The possible clinical application of splenorenal shunts in the surgical treatment of patients with diabetes mellitus is discussed, along with the relations between portacaval shunts or cirrhosis, reduced hepatic metabolism of circulating hormones, and sequellae such as gastric hypersecretion and peptic ulcers.

900 **IMMUNOLOGICAL STUDIES ON CANCER-SPECIFIC GASTROINTESTINAL TRACT ANTIGENS PURIFIED WITH FLUOROCARBON.** *(Jap.)* Matsumoto, D. (Fac. Med., Hirosaki U., Japan), M. Konn, T. Tanaka, N. Aoki, H. Kawashima, K. Kodama and Y. Sugiyama. *Hirosaki Med J* 20(1):152-159, 1968.

Correlations among the antigens of the stomach, colon, rectum, and anus were examined with the Ouchterlony gel-diffusion technique using rabbit antisera prepared against fluorocarbon-labeled purified antigens extracted from malignant gastric, colonic, rectal, and anal tissue. It was noted that 1 precipitin band formed between rectal cancer and its antiserum, 1 precipitin band formed between rectal cancer and the antiserum to gastric cancer, and the common antigenicity of colon and anal cancer was demonstrated with antiserum prepared against gastric cancer. Thus, there appear to be common antigens in various types of gastrointestinal malignancies.

901 **INTESTINAL ISCHEMIC SYNDROMES.** *(E.)* Bergan, J. J. (Northwestern U. Med. Sch., Chicago, Ill.), L. Dry, J. Conn Jr. and O. H. Trippel. *Ann Surg* 169(1): 120-126, 1969.

On the basis of experience with 22 patients (16 men and 6 women, 36-77 yr old) who underwent intestinal arterial revascularization over an 8-yr period, two categories of intestinal ischemic syndromes are defined. These are chronic intestinal ischemia, including celiac and superior mesenteric occlusions, and acute intestinal ischemia, including embolic, thrombotic and nonorganic occlusions. Among 6 patients (48-77 yr old) who presented with celiac axis occlusions, 4 had severe atherosclerotic coronary or peripheral arterial insufficiency; pain related to food intake was common, and marked weight loss occurred in all 6 patients. Operative repair was curative in each case. Two men (62 and 63 yr old) and one woman (58 yr old) underwent reconstruction of superior mesenteric arteries for chronic occlusion; their signs, symptoms and laboratory findings were extremely variable. Among the cases in the acute group, 8 patients had superior mesenteric arteries occluded by emboli; clinical manifestations were rapid onset of abdominal pain, vomiting, diarrhea, leukocytosis, history of prior embolization and an obvious source for the embolus. Bowel resections were performed in only 3 patients. Two patients appeared to have acute mesenteric arterial occlusions, but clinical circumstances suggested a nonorganic cessation of blood flow.

902 **THE UPPER GASTROINTESTINAL TRACT IN PATIENTS UNDERGOING CHRONIC DIALYSIS.** *(E.)* Wiener, S. N. (Mt. Sinai Hosp., Cleveland, Ohio), V. Vertes and H. Shapiro. *Radiology* 92(1):110-114, 1969.

The radiologic appearance of the upper gastrointestinal tract was studied in 48 patients (25 males and 23 females) undergoing chronic dialysis. Fourteen patients had been maintained by intermittent peritoneal lavage for periods of 6-24 months, while 34 patients had been treated by hemodialysis for periods of 6-34 months. The upper gastrointestinal tract appeared normal in the initial examination as well as in subsequent follo up studies in 15 of the 48 patients. Four had been maintained on peritoneal lavage and 11 were from the hemodialysis group. Radiologically, the upper gastrointestinal tract was abnormal in the remaining 33 patients and the findings were constant for each individual. These abnormalities included a "wet stomach" with prominent gastric folds in 11 patients, abnormal appearan of the duodenal bulb with prominence and enlargement of the duodenal folds in 21 patients, and prominence of the mucosal pattern with enlarged folds involving the proximal portion of the descending duodenum in 8 patients. Acute pancreatitis wa diagnosed clinically in 9 patients and at autopsy in 2 others, a may have been responsible for the radiological changes.

903 **A TALE OF TWO CITIES: A COMPARISON OF SARCOIDOSIS IN LONDON AND NEW YORK.** *E.)* James, D. G. (Royal Northern Hosp., London, England), L. E. Siltzbach, O. P. Sharma and L. S. Carstairs. *Arch Intern Med* 123(2):187-191, 1969.

A series of 537 patients (235 males and 302 females, 88% Caucasian) with sarcoidosis in London was compared with a roup of 311 patients (100 males and 211 females, 47% Negro nd 17% Puerto Rican) with sarcoidosis in New York. In both roups, 67-71% were under 40 yr of age. Africans were under-epresented in London (although there were twice as many West ndians as would be expected), but the incidence in New York vas 10 times as high among Negroes as among whites. Despite he marked differences in ethnic background, there was a close imilarity in the extent and frequency of involvement of various rgans, as well as in the clinical and radiological features. Most rgans of the body were found to be invaded, although biopsies f a peripheral or scalene lymph node, skin or liver were the ost fruitful sources for histological confirmation of the disease. he overall mortality rate in both groups was about 8%, but orticosteroids and other antiinflammatory agents were generally ffective.

04 **PRIMARY HYDATID CYSTS OF THE LIVER, PANCREAS AND PAROTID GLAND.** *(Sp.)* orel, C. J. L. (J. M. Ramos Mejía Munic. Hosp., Buenos ires, Argentina), D. M. Filippin and E. J. González. *Prensa ed Argent* 55(28):1354-1355, 1968.

05 **ABDOMINAL HYDATIDOSIS.** *(Sp.)* Allende, J. M. *Prensa Med Argent* 55(28):1356-1367, 968.

06 **GASTROINTESTINAL HYDATIDOSIS IN NORTHWESTERN ARGENTINA.** *(Sp.)* Palazzo, H. and A. Bollea. *Prensa Med Argent* 55(28):1343-1348, 968.

07 **HYDATIDOSIS OF THE DIGESTIVE TRACT: EXPERIENCE AT THE SANTAMARINA HOS-TAL OF TANDIL.** *(Sp.)* Cereseto, P. L. (Ramón Santa-arina Munic. Hosp., Tandil, Argentina), J. L. Curuchet, J. H. entile and D. R. Grasso. *Prensa Med Argent* 55(28):1370-71, 1968.

08 **PERITONEAL HYDATIDOSIS.** *(Sp.)* Bettalemmi, J., R. F. Vanella, D. Pradella and A. Camacho. *ensa Med Argent* 55(28):1368-1369, 1968.

9 **THE TREATMENT OF ABDOMINAL HYDATIDOSIS.** *(Sp.)* **MEDICAL AND SURGICAL SPECTS OF** Saravia Canepa, H., R. Vivas and J. M. García s. *Prensa Med Argent* 55(28):1331-1334, 1968.

0 **HYDATIDOSIS OF THE DIGESTIVE TRACT.** *(Sp.)* Olaciregui, J. C. (Rawson Hosp., Buenos res, Argentina). *Prensa Med Argent* 55(28):1374-1379, 68.

1 **THE CURRENT STATUS OF THE ZOLLINGER-ELLISON SYNDROME.** *(Sp.)* Galmarini, O. V. ("Bme. Churruca" Police Hosp., Buenos Aires, Argentina). *Prensa Med Argent* 55(26):1265-1270, 1968.

912 **THE SYSTEMATIC INVESTIGATION OF CHRONIC DIARRHEA.** *(Fr.)* Naudin, G. *Concours Med* 90(39):6127-6136, 1968.

913 **EPIDEMIOLOGY OF HUMAN INTESTINAL PARASITOSES.** *(Pol.)* Iwanczuk, I. (Polish Inst. Hyg., Warsaw, Poland) and I. Stobnicka. *Wiad Parazyt* 14(4): 407-424, 1968.

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NOTE

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LANGUAGE ABBREVIATIONS

Afr.	Afrikaans	It.	Italian
Ar.	Arabic	Jap.	Japanese
Bul.	Bulgarian	Kor.	Korean
Ch.	Chinese	Latv.	Latvian
Cz.	Czech	Lith.	Lithuanian
Dan.	Danish	Nor.	Norwegian
Dut.	Dutch	Pol.	Polish
E.	English	Por.	Portuguese
Eston.	Estonian	Rum.	Rumanian
Fin.	Finnish	Rus.	Russian
Fl.	Flemish	Ser.	Serbo-Croatian
Fr.	French	Sl.	Slovak
Ger.	German	Sp.	Spanish
Gr.	Greek	Sw.	Swedish
Heb.	Hebrew	Th.	Thai
Hun.	Hungarian	Turk.	Turkish
Ic.	Icelandic	Uk.	Ukrainian
In.	Indonesian	Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone	mC, µC	milli-, microcurie(s)
ADP	adenosine diphosphate	mg	milligram(s)
AMP	adenosine monophosphate	min	minute(s)
ATP	adenosine triphosphate	ml	milliliter(s)
BSP	sulfobromophthalein	mm	millimeter(s)
C	degrees centigrade	MTD	maximum tolerated dose
cm	centimeter(s)	ng	nanogram (10-9)
CNS	central nervous system	pg	picogram (10-12)
cpm	counts per minute	p.o.	orally
DNA	deoxyribonucleic acid	ppm	parts per million
e.g.	for example	r	Roentgen
g	gram(s)	RBC	red blood cells (erythrocytes), red blood count
µg	microgram(s)		
hr	hour(s)	resp.	respectively
i.m.	intramuscular	Rev.	review (only in citations)
i.p.	intraperitoneal	RNA	ribonucleic acid
IU	international unit(s)	s.c.	subcutaneous
i.v.	intravenous	sec	second(s)
kg	kilogram(s)	SGOT	serum glutamic-oxalacetic transaminase
LD50	median lethal dose(s)	SGPT	serum glutamic-pyruvic transaminase
LDH	lactic acid dehydrogenase	U	unit(s)
m	meter(s)	UV	ultraviolet
M	molar	WBC	white blood cells (leukocytes), white blood count
mEq	milliequivalent(s)		
mM	millimolar	yr	year(s)
µM	micromolar		

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

1005 **MORPHOLOGICAL AND HISTOCHEMICAL PROPERTIES OF THE REGENERATED MUCOSA IN THE ILEUM OF THE RAT.** *(E.)* Penttilä, A. (Dept. Anat., U. Helsinki, Finland), M. Lempinen and G. Fock. *Scand J Gastroent* 3(3):255-263, 1968.

In 15 adult Sprague-Dawley rats, a defect in the wall of the terminal ileum was surgically created and covered with the serous coat of the parallel-lying colon. The microscopic appearance and activity of histochemically demonstrable enzymes were determined from sections of the defect site, including both the ileal and colonic walls, 2-6 weeks later. Two weeks after operation, epithelial migration towards the granulation tissue was noted, accompanied by the rapid development of primitive crypts and villi. Transformation of epithelial cells into cuboidal and columnar types were evident at the healing margin. At 4 weeks, the new mucosa showed all stages of regeneration (flat epithelium, essentially normal mucosa) and at 6 weeks it resembled normal ileal mucosa. However, villi were more irregularly arranged. The external and internal muscular layers and the muscularis mucosae showed only minor regenerative ability. No large differences in enzyme activity were found between the new and normal ileal mucous membrane, with 2 exceptions: 1) cytochrome oxidase acitivity was greater in the crypts and villi of the new mucosa than in the adjacent normal ileum, and 2) on the edges of the regenerative process no ATP activity was found in the crypts in contrast to weak activity in the normal ileum.

1006 **HISTOCHEMICAL DETECTION OF BILIRUBIN IN THE GALL BLADDER EPITHELIUM OF THE MOUSE UNDER NORMAL CONDITIONS.** *(E.)* Grzycki, S. (Med. Acad., Lublin, Poland) and I. Krolikowska. *Z Mikr Anat Forsch* 79(1):151-156, 1968.

Sections of gallbladder from healthy white mice, stained with Fouchet's reagent according to the histochemical methods of Stein and Hall, revealed the presence of bilirubin in epithelial cells and in histiocytes of the reticuloendothelial system. Both techniques demonstrated bilirubin granules in the supranuclear zone of the cytoplasm or distributed throughout the entire epithelial cell. The granules varied in size and in color, suggesting various concentrations of bilirubin in the cells. While both histochemical methods were specific, highly sensitive and exact, Stein's test revealed fine granules of pigment and Hall's test detected larger granules more specifically. Accumulated bilirubin granules were observed in the swollen apical portion of epithelial cells protruding into the lumen; this is indicative of apocrine type secretion. The cytological appearance of the gallbladder epithelium varied with the functional state of the cells. The presence of bilirubin in cells of the reticuloendothelial system confirms previous observations that such cells in the spleen and bone marrow have the capacity to yield bilirubin. It is suggested that the gallbladder epithelial cells participate in the secretion of bilirubin granules produced by the cells of the reticuloendothelial system.

1007 **CELL PROLIFERATION KINETICS IN THE GASTROINTESTINAL TRACT OF MAN. IV. CELL RENEWAL IN THE INTESTINALIZED GASTRIC MUCOSA.** *(E.)* Winawer, S. J. (New York Hosp.-Cornell Med. Ctr., N. Y.) and M. Lipkin. *J Nat Cancer Inst* 42(1):9-17, 1969.

The kinetics of cell proliferation were analyzed in the extensively intestinalized atrophic gastric mucosa of a 77-yr-old man with cancer of the stomach; he had received neither chemotherapy nor radiation treatment. Ten mC of thymidine-methyl-^{3}H (^{3}H-TDR) were injected i.v. and biopsy specimens from the mucosa adjacent to the tumor, taken at frequent intervals 1-48 hr and 4 days after injection, were evaluated by microautoradiography. The gastric mucosa showed a markedly reduced number of glands containing parietal and chief cells and many glands composed of intestinal principal, goblet and Paneth cells. Well-defined intestinal crypts were present in all biopsy specimens. Gastric cells and intestinal principal cells were found in about equal numbers, together comprising 90% of the total epithelial-cell population of 10,081 cells. Goblet cells were less frequent (9.7%) and Paneth cells were rare (0.3%). One hr after injection of ^{3}H-TDR, gastric mucous, intestinal principal, goblet and Paneth cells were labeled, and labeled mitoses of each of these cell types were subsequently observed. The frequencies of mitoses and labeled cells were greater than those previously reported in gastric mucosa and were comparable to measurements made in the small intestine of man. The cell-cycle-phase durations (about 30 hr) of gastric and intestinal principal cells were similar to those of normal gastric and intestinal cells of man. Studies of the spatial distribution of DNA-synthesizing cells demonstrated that thymidine continued to be incorporated into gastric and intestinal cells at or near the luminal surface of the atrophic gastrointestinal mucosa. In contrast, in normal gastric mucosa, labeled proliferative cells were found to be separated from the luminal surface by unlabeled, maturing cells which cease DNA synthesis during maturation as they migrate to the surface. ^{3}H-TDR-labeled cells migrated toward the luminal surface at a rate which approximated 1 cell position in 3-5 hr in both intestinalized and normal mucosa. The continued synthesis of DNA in gastric and intestinal epithelial cells during their entire life-span may be related to the development of carcinoma.

1008 **ALKALINE PHOSPHATASE ISOZYMES IN THE DUODENUM OF THE MOUSE: ATTAINMENT OF PATTERN OF SPATIAL DISTRIBUTION IN NORMAL DEVELOPMENT AND UNDER THE INFLUENCE OF CORTISONE OR ACTINOMYCIN D.** *(E.)* Moog, F. (Dept. Biol., Washington U., St. Louis, Mo.) and R. D. Grey. *Develop Biol* 18(5):481-500, 1968.

By sectioning the villi at right angles to their length, the distribution of alkaline phosphatase (AP) activity and the relative rates of hydrolysis of phenylphosphate (PhP) and β-glycerophosphate (bGP) were studied in duodenal segments of SWR/J mice from 11 days after birth to young adulthood (20-30 days). In the 11-day-old mouse, AP activity was fairly uniform along the length of the villus, with slightly lower activity at the tip. The relative rates of PhP and bGP hydrolysis also did not vary from villi tips to bases, indicating a single molecular form of AP having a PhP/bGP ratio of about 0.7. By 14 days, AP activity increased significantly, PhP/bGP ratios rose, indicating the appearance of new isozymes, and a phosphatase gradient developed with higher activity and higher PhP/bGP ratios at the villus tips than at the basal levels. From 16-20 days both the specific activity and the ratio rose to or above the adult level and the gradients from tip to base steepened. After 20 days the overall activity declined sharply, with much overlapping of enzyme activity and ratio values at all villus levels, but by 30 days, enzyme activities began to approximate the adult pattern. The marked tip-to-base gradient of activity, with strictly segregated ratios, previously described for 10-week-old adults probably is not attained until after the end of the 1st postnatal month. At no stage was the activity or ratio higher at the villus bases than at their tips. A single s.c. injection of 30 μg/g body weight of cortisone in 9-day-old mice substantially elevated both AP activity and the PhP/bGP ratio along the entire length of the villus at 60 hr. Administration of 0.45 μg/g actinomycin D s.c. to infant mice produced an inverted gradient with both activity and ratio declining from base to tip; in adult mice, actinomycin at 0.9-1.0 μg/g significantly increased phosphatase activity and the PhP/bGP ratio over the entire villus surface. These results are consistent with the development of a regulatory system which controls the rate at which the phosphatase isozymes emerge as the epithelial cells migrate from the crypts to the villus tips.

1009 THE SIZE OF THE LIVER: MODERN METHODS FOR ITS CLINICAL DETERMINATION AND NORMAL VALUES FOR CHILDREN.

(Ger.) Sachtleben, P. (Pediat. Clin., U. Saar, Homburg, Germany) and O. Rüter. *Praxis* 57(48):1696-1699, 1968.

The distance between the upper and lower margins of the liver was measured by percussion and auscultation in 1162 normal children, including 217 at birth, 235 at 3-4 yr, 194 at 6-7 yr, 281 at 9-11 yr, and 235 at 14-15 yr. Measurements were made on subjects in a supine position, in the middle of a breath, at the same time of day and after the same kind of physical activity. Results, presented in a table, were reproducible. In contrast to adults, the livers of all newborns were palpable below the rib cage. The percentage of children with palpable livers decreased with age, reaching 10% among children 14-15 yr old. The height of the liver averaged 2-4% higher in boys than in girls, but this difference was significant only in 6-7 yr-old children. Among the 14-15 yr-old group the liver height was significantly greater in children with leptosomatic builds than in those with athletic or pyknic builds. There was a good correlation between liver height and liver weight, as reported by pathologists, in all but the newborn group. As a rule of thumb the height of the liver is 5% of the height in children and 10% of the height in newborns.

1010 THE EFFECT OF THE NATURE OF THE MESENCHYME ON DIFFERENTIATION OF THE GASTRIC EPITHELIUM IN 13-DAY-OLD RABBIT FETUSES.

(Fr.) David, D. (Lab. Animal Biol., Fac. Sci., Clermont-Ferrand, France). *C R Soc Biol (Paris)* 162(5/6):1142-1144, 1968.

Gastric epithelium from 13-day-old rabbit fetuses was cultured *in vitro* for 24 hr and then grafted onto rabbit mesenchyma from different organs or onto mesenchymal tissue from chick embryos. After 2 weeks the grafts were fixed in Gendre's fluid, sectioned, and examined after staining with Schiff's periodic acid and hemalum. When gastric epithelium was grafted onto gastric mesenchyme from rabbits it became flat and pseudostratified, developing in 2 layers. On rabbit esophageal mesenchyme the epithelium either became pseudostratified and organized into 2 layers (60%), differentiated into typical gastric mucosa (30%), or became stratified and developed a characteristic esophageal structure (10%). Gastric epithelium developed more or less normally on tracheal or pulmonary mesenchyme from rabbits. Growth of gastric epithelium was inhibited when it was grafted onto rabbit liver mesenchyme. On rabbit mesonephron the epithelium developed a structure similar to that of the mesonephric tubules in some places. Grafted onto rabbit skin from the lateroventral region, the epithelium often invaginated into the underlying skin or, less frequently, became pseudostratified, developing into an epithelium which was malpighian where it came into contact with the skin and mucosal farther away. Growth of the gastric epithelium was not favored by grafting it onto tracheal or pulmonary mesenchyme from 5-11-day-old chick embryos or gizzard mesenchyme from 5-18-day-old chick embryos.

1011 COMPARISON BETWEEN MORPHOLOGICAL CHANGES IN THE EXOCRINE PANCREAS IN ADULT AND ELDERLY SUBJECTS AFTER HORMONE STIMULATION.

(It.) Faggioli, F. (2nd Inst. Spec. Med. Path., U. Bologna, Italy), E. Roda and V. Fortini. *G Clin Med* 49(10):950-960, 1968.

Exocrine pancreatic secretion was stimulated by 80 U of secretin i.v., 90 U of pancreozymin i.v., or a combination of both hormones 1.5 hr before surgery in 6 subjects (3 men and 3 women, aged 39-81 yr) with diseases which did not affect the pancreas. Material biopsied from the pancreas during surgery was examined under the electron microscope. In adults who had been given secretin many zymogen and prezymogen granules were observed in acinar cells. Canals in the endoplasmic reticulum were irregularly dilated, and the mitochondria were round with clear matrices and contained a few short cristae. The same changes were seen in elderly subjects, but only a very small increase occurred in the number of secretory granules. Only a few zymogen granules were found in the apical part of exocrine cells in adults who had been given pancreozymin. Very few prezymogen granules were present in the Golgi apparatus. Acini were filled with an osmophilic material. Cytoplasmic organelles were normal. In contrast, hardly any secretory granules were found in the acinar cells of elderly subjects receiving pancreozymin. Alterations, which were also seen under basal conditions, were observed in the cytoplasmic organelles and interacinar tissue. A combination of secretin and pancreozymin produced most of the changes described above in both adult and elderly subjects. However, increases in secretory granules, hyperplasia of the Golgi apparatus and nucleoli, and the amount of osmophilic material present in lumens of the acini were much less marked in elderly subjects. In addition, an increase in the amount of filamentous tissue present in the acini was noted in elderly subjects. The difference between changes occurring in adult and elderly subjects is attributed to reduced metabolic activity in pancreatic cells of the latter.

1012 INTESTINAL CAPILLARIES. I. PERMEABILITY TO PEROXIDASE AND FERRITIN.

(E.) Clementi, F. (Rockefeller U., New York, N. Y.) and G. E. Palade. *J Cell Biol* 41(1):33-58, 1969.

Horseradish peroxidase (molecular diameter = 50A) and ferritin (molecule diameter = 110A) were used as probe molecules for the small and large pore system, resp., in blood capillaries of the intestinal mucosa of the mouse. Peroxidase distribution was followed in time after i.v. injection by applying the Graham-Karnovsky histochemical procedure to aldehyde-fixed specimens. The marker was found to leave the plasma rapidly and to reach the pericapillary spaces 1 min after injection. Between 1 min and 1 min 30 sec, gradients of peroxidase reaction product could be demonstrated regularly around the capillaries with the highest concentrations located opposite the fenestrated parts of the endothelium. These gradients were replaced by an even distribution after 1 min 30 sec. Ferritin, followed directly by electron microscopy, appeared in the pericapillary spaces 3-4 min after i.v. injection. Initial gradients were noted as with peroxidase. For both markers, there was no evidence of movement through intercellular junctions, and transport by plasmalemmal vesicles appeared less efficient than outflow through fenestrae. It is concluded that, in the blood capillaries of the intestinal mucosa, the diaphragms of the endothelial fenestrae contain the structural equivalents of the small pore system. The large pore system seems to be restricted to a fraction of the fenestral population which presumably consists of diaphragm-free or diaphragm-deficient units.

1013 **EXPERIMENTAL STUDIES ON NERVES IN REGENERATED LIVER.** *(E.)* Yasui, K. (Kyoto U. Med. Sch., Japan). *Arch Jap Chir* 38(1):59-75, 1969.

At varying time intervals after 70% hepatic resection, the regenerating liver of albino rats was studied neurohistologically by Suzuki's modification of Bielschowsky's silver impregnation technique. In the early stages after resection, granular degeneration and fragmentation of the elementary fibers in the terminal reticulum (intrahepatic endings of the autonomic nerves) and vacuole formation in the cytoplasm of the interstitial cells were observed. These alterations were most striking 24 hr after resection, but were not detectable at 48 hr. No degenerative changes were observed in the nerve fibers in the interlobular connective tissue at any time. At 3-6 months after resection, proliferative changes were more apparent in the nerve fibers in the terminal reticulum than in fibers in the interlobular connective tissue.

1014 **PLASMA MEMBRANES OF THE RAT LIVER: ISOLATION AND ENZYMATIC CHARACTERIZATION OF A FRACTION RICH IN BILE CANALICULI.** *(E.)* Song, C. S. (Rockefeller U., New York, N. Y.), W. Rubin, A. B. Rifkind and A. Kappas. *J Cell Biol* 41(1):124-132, 1969.

Utilizing a method for the rapid isolation from rat liver of a plasma membrane fraction containing a high concentration of intact bile canaliculi, the enzymatic characteristics of this fraction were determined. Ultrastructural analysis of the isolated bile canaliculi revealed no major differences from features exhibited in the intact liver cell. The isolated fraction contained the same concentration of 5$'$-nucleotidase activity as reported for other preparations of plasma membranes. In the presence of 0.01 M Mg^{++}, 5$'$-nucleotidase was noted to have a double pH optimum at pH values of 7.5 and 9.5. Glucose-6-phosphatase and alkaline phosphatase were present, but in low amounts. Cytochrome P-450 was not detectable. Sodium-potassium activation of ATPase was noted to be 20-36% in half of the assays. The use of fractions containing intact bile canaliculi should prove useful in studying the biochemical events associated with the transport of bile constituents into canaliculi.

1015 **RECEPTOR DEVELOPMENT IN THE INTESTINAL MESENTERY OF THE HUMAN FETUS.** *(Rus.)* Zalaldinov, R. G. (S. V. Kurashov State Med. Inst., Kazan, USSR). *Arkh Anat* 56(1):77-79, 1969.

Mesenteric lymph nodes in the human fetus are innervated only by free receptors which, at 4 months, form loose, nonmyelinated fibers. Around 6 months their structure becomes more compact and their fibers gradually become myelinated. Incapsulated receptors are made up of Vater-Pacini corpuscles and bulb-like structures. They start to develop at 4 months, forming myelinated fibers at the distal end which are surrounded by nuclei of glial cells. By 5 months there are several layers around the distal end of the fiber which becomes bulbous and is surrounded by a stratified capsule. Development is complete by 7-8 months. These receptors are found along blood vessels and nerve trunks, particularly in the root of the mesentery of the large intestine.

1016 **SULFATASE ACTIVITY OF THE JEJUNUM AND ILEUM OF RATS DURING POSTNATAL DEVELOPMENT.** *(E.)* Heringova, A. (Inst. Physiol., Czechoslovak Acad. Sci., Prague, Czechoslovakia), O. Koldovsky, S. J. Yaffe and V. Jirsova. *Biol Neonat* 13(1/2):1-6, 1968.

Sulfatase activity was determined in homogenates of the jejunum and ileum of Wistar rats during postnatal development, using p-nitrocatechol sulfate as substrate. At low substrate concentrations (0.0025 M) in both suckling and adult rats, maximal activity in the jejunum and ileum was at pH 4.5 and pH 6.0, resp.; with high substrate concentrations (0.060 M) maximal activity was found at pH 4.5-5.0. The sulfatase activity in the jejunum remained constant during postnatal development, whereas activity in the ileum after birth increased several fold, attaining a maximum on the 11th postnatal day Ileal activity then decreased to the same levels as in the jejunum by the 3rd week. Adrenalectomy performed on the 13th day resulted in a decrease of the sulfatase activity. These and previous results show that the ileum assumes a special place in suckling animals; further work will determine the functional significance of these findings.

1017 **ON THE INTRACELLULAR DISTRIBUTION OF ALKALINE PHOSPHATASE IN HUMAN LIVER AND INTESTINE.** *(E.)* Ghosh, N. K. (Tufts U. Sch. Med., Boston, Mass.) and L. Kotowitz. *Enzymologia* 36(1): 54-58, 1969.

The alkaline phosphatase activities of the subcellular components (nuclei, mitochondria, lysosomes, microsomes and supernatant fractions) isolated from frozen autopsy specimens of human liver and intestine by a differential centrifugation procedure were determined. The extent of inhibition of alkaline phosphatase activity in the particulate fractions of liver and intestine by 5 mM L-phenylalanine was also determined. A significant difference in the distribution patterns of the enzyme in the 2 tissues was noted: in the intestinal tissue, 75% of the enzyme was found in the supernatant fraction, while in the liver tissue, 70% of the enzyme was located in the particulate fractions. The degrees of inhibition of mitochondrial, lysosomal, and microsomal alkaline phosphatases of intestinal mucosa were all higher than 70% with 5 mM L-phenylalanine, whereas less than 25% inhibition was noted with liver subcellular components. The cytoplasmic abundance of alkaline phosphatase in the intestinal cell provides support for considering the intestine as one of the major sources of normal serum alkaline phosphatase.

1018 FLUORESCENT HISTOCHEMICAL STUDIES ON THE MUCOSA OF THE VERTEBRATE GASTROINTESTINAL TRACT. *(E.)* Read, J. B. (Dept. Zool., U. Melbourne, Victoria, Australia) and G. Burnstock. *Histochemie* 16(4):324-332, 1968.

The adrenergic innervation of the gastrointestinal mucosa of the guinea-pig was compared with that of some lower vertebrates, including the toad (*Bufo marinus*), lizard (*Tiliqua rugosa*), eel (*Anguilla occidentalis australis*), and trout (*Salmo trutta* and *S. irideus*) by means of a fluorescent histochemical technique. Toads were also treated with epinephrine or norepinephrine (10 mg/kg) 1 hr before pithing, and excised portions of the trout gut were incubated *in vitro* with a solution containing norepinephrine or α-methyl-norepinephrine (10^{-5} g/ml). In the toad, green fluorescent nerves were observed in the gut after exposure of the tissue to formaldehyde vapors for 3 hr. The fluorescence intensity was higher, however, in animals pretreated with epinephrine or norepinephrine, a greater stability being noted with the latter. Most fluorescent nerves observed in the mucosa were associated with blood vessels with a sparse system of nerves in the perivascular plexi in the lamina propria and the submucosa. In the lizard, fine fluorescent varicose nerve fibers were noted scattered in the lamina propria and appeared to be derived from the perivascular plexi in the submucosa and mucosa. Few fluorescent nerves were observed in the muscularis mucosae. In the guinea-pig, green fluorescent nerves in the mucosa were present in perivascular plexi and were most numerous in association with arterioles in the lamina propria. Intensely fluorescent yellow enterochromaffin cells, similar to those observed in other animals, were found scattered in the mucosal epithelium, especially the duodenum. Few fluorescent nerves were observed in the mucosa of the eel gut, with almost all being located in perivascular plexi at the base of the mucosa. Scattered yellow enterochromaffin cells were observed in all regions of the gut. The trout gut mucosa also showed few fluorescent nerves; these were associated with blood vessels in the lamina propria and could be identified with certainty only after incubation with amines. Yellow fluorescent enterochromaffin cells were present in the mucosa of the esophagus and stomach but were not present in the intestine. These studies reveal that adrenergic nerves in the mucosa generally occur in perivascular plexi with no adrenergic innervation of the muscularis mucosae.

1019 UBIQUINONE LEVELS OF HUMAN LIVER IN HEALTH AND DISEASE. *(E.)* Phillips, W. E. J. (Food Drug Direct., Dept. Natl. Health Welfare, Ottawa, Canada), K. Hoppner, T. K. Murray and J. S. Campbell. *Canad J Physiol Pharmacol* 47(3):227-231, 1969.

The ubiquinone content of liver tissue was determined postmortem in male Sprague-Dawley rats and humans using either the whole liver or the isolated nonsaponifiable liver fraction. Exposure of intact rat carcasses to room temperature, refrigerator temperatures, or both consecutively for 24-hr periods produced no significant changes in the percentage of nonsaponifiable components or the total amount of ubiquinone in the liver. The ubiquinone content of the nonsaponifiable material isolated from human liver and stored at -20C for up to 140 days showed no apparent change; however, longer storage periods produced a decrease in ubiquinone levels. In contrast to the stability of ubiquinone in the nonsaponifiable fraction, there was a decrease in ubiquinone when liver homogenates were stored. In man, the range of ubiquinone levels for all age groups was greater than that reported for other animal species and showed an increase during the 1st year of life. No differences were found in the ubiquinone concentrations in normal individuals who died accidentally and those who died from a variety of disease states. No correlations between the vitamin A status of the individuals and ubiquinone levels were noted. Extreme variations in ubiquinone concentrations within any given age or disease group suggest that unknown factors may influence ubiquinone levels in human liver.

1020 THE COMPOSITION OF THE GLYCOLIPIDS IN DOG INTESTINE. *(E.)* McKibbin, J. M. (U. Alabama Med. Ctr., Birmingham). *Biochemistry* 8(2):679-685, 1969.

Preparative silicic acid chromatography of whole lipid extracts of dog small intestine yielded 3 major glycolipid fractions. Further fractionation by column chromatography with Florisil, DEAE-cellulose and silicic acid, as well as by thin-layer chromatography, separated 7 classes of glycolipid in high yield. The distribution of cerebroside, sulfatide, dihexoside, trihexoside, pentahexoside, hexahexoside and ganglioside was shown to be 0.162, 0.062, 0.098, 0.041, 0.070, 0.014 and 0.171 μM/g fresh tissue, resp. The longer oligosaccharide-containing fraction appeared to be a mixture of ceramide hexahexosides containing glucose, galactose, hexosamine and fucose. All of the isolated lipid fractions were glycosides of glucosylceramide with long-chain fatty acids. The total content of the 7 various types of glycolipid was 3.98 μM/g of dry lipid-free tissue, accounting for 82.1% of the total lipid hexose in the original silicic acid subfractions. The remaining 17.9% of lipid hexose was unidentified. The pattern of distribution of intestinal glycolipids in the dog differed from that of other tissues which have been studied in that the ceramide tetrahexoside was absent, being replaced by the penta- and hexahexoside. It appears that the glycolipids show more organ and species specificity than do other classes of lipids.

1021 THE PHYLOGENETIC OCCURRENCE OF LYMPHOCYTES WITHIN THE GUT EPITHELIUM. *(E.)* Fichtelius, K. E. (Variety Club Heart Hosp., Minneapolis, Minn.), J. Finstad and R. A. Good. *Int Arch Allerg* 35(2):119-133, 1969.

In an effort to locate the equivalent of the bursa of Fabricius in bursaless vertebrates and to extend previous observations which suggested that lymphocytes present in the gut epithelium may represent a primitive diffuse lymphoid system with bursal function (antibody and immunoglobulin synthesis), the relative number of theliolymphocytes per 1000 epithelial nuclei was determined in the epithelium of the fore-, mid- or hindgut of several phylogenetically representative species. Animals which show little immunological responsiveness (lamprey, guitar fish, horned shark) had low numbers of theliolymphocytes (up to 6%) situated at the basement membrane. In good antibody producers (paddlefish, garfish, bowfin) the mean number of theliolymphocytes among the epithelial cells ranged as high as 34%; these cells usually were arranged along the epithelial side of the basement membrane. Amphibia demonstrated about an 8% count (many theliolymphocytes with marked pyroninophilia), the frequency rising to about 20% in reptiles. In mice, rats and humans the frequency of theliolymphocytes varied between 5 and 10%, but was very high (12-23%) in the rabbit. The theliolymphocytes were very numerous in dome epithelium covering the Peyer's patches in the rabbit intestine. The highest number of theliolymphocytes observed in birds was 12% in the epithelium covering aggregations of lymphoid cells in turkey ileum. No equivalent of the dome epithelium was found. Gut-associated lymphoepithelial microorgans (described elsewhere) also were observed in this series of animals; it is postulated that they could be regarded as possible bursa equivalents. The lymphocytic cell populations encountered in the gut epithelium of this phylogenetic series may function as a primitive lymphoid organ even in animals with specialized lymphoepithelial microorgans.

1022 POSTNATAL DEVELOPMENT OF THE SMALL INTESTINE OF THE RAT: CHANGES IN MUCOSAL MORPHOLOGY AT WEANING. *(E.)* Herbst, J. J. (Stanford U. Sch. Med., Palo Alto, Calif.) and P. Sunshine. *Pediat Res* 3(1):27-33, 1969.

The kinetics of cell proliferation and differentiation in the small intestine were investigated in weanling Wistar rats and the effects of premature weaning and of hydrocortisone administration on the maturation of the small intestine were evaluated. After 15 days of age, there was a 60% increase in the relative weight of the jejunum and ileum, a marked decrease in the ratio of the height of the villus to the depth of the crypt, and a significant increase in both the mitotic and the labeling index of crypt cells. These data indicate that at the time of weaning there is an increase in the absolute and relative population of proliferating cells and in the rate of proliferation of crypt cells. The biological half-life of ^{14}C-phenylalanine in the whole intestinal mucosal homogenate of the rat at 21 days was 36 hr compared with 60 hr for the fully weaned 32-day-old rat. Radioautography of crypt cells also demonstrated a decreased half-life of ^{3}H-leucine in 6- and 21-day-old animals (15 and 11 hr, resp.) compared to 32-day-old rats (22 hr). This suggests that the rate of protein turnover in the intestinal mucosa of the young rat is not correlated with cell turnover. In rats 9-15 days old, gavage feeding of an artificial formula resulted in a weight gain similar to that of sham-fed controls and an increase in the relative intestinal weight, mitotic index, and a depth of jejunal crypts, as well as precocious invertase activity. Prolonged s.c. administration of hydrocortisone (25 mg/kg/day x 8 days) to 3-day-old rats produced similar precocious maturation in the duodenum and jejunum, but not in the ileum. These changes correlated with a 4-fold increase in the rate of cellular migration along the villus. Administration of the steroid to newborn rats for 3-6 days or to 12-day-old rats for 3 days did not produce any intestinal changes. Both diet and hormones appear to regulate the onset of maturation of the intestine at weaning.

1023 GAMMA GLUTAMYL TRANSPEPTIDASE, MEASUREMENT AND DEVELOPMENT IN GUINEA PIG SMALL INTESTINE. *(E.)* Cohen, M. I. (Albert Einstein Coll. Med., Yeshiva U., Bronx, N. Y.), L. M. Gartner, O. O. Blumenfeld and I. M. Arias. *Pediat Res* 3(1):5-10, 1969.

A modification of a previous method for the assay of γ-glutamyl-transpeptidase (GGTP) activity in guinea pig whole intestinal homogenates is described and applied to the study of the developmental pattern of this intestinal peptidase in the neonatal guinea pig. Solubilization of the chromogenic substrate γ-glutamyl-β-naphthylamide in a medium containing 0.05 M carbonate and 0.1 M Tris buffer at pH 9.5 and the use of heat eliminated the substrate solubility difficulties reported by others. Studies on 69 guinea pig fetuses at 55 and 63 days of gestation and at 1, 3, 9, 24, 55 and 90 days post-partum revealed an overall pattern of high GGTP activity in jejunal homogenates during prenatal life and at 1 day after birth, with a rapid decline during the neonatal period (3-24 days of age). A slight increase in activity occurred after 55 days of age, until adult values were reached at 90 days. In 6 adult animals GGTP activity was found to be greater in whole homogenates of liver and kidney than in similar preparations of duodenum, jejunum or ileum. Subcellular fractionation of intestinal mucosa using ultracentrifugation demonstrated a 20-fold greater enzyme activity in jejunal brush border membrane than in whole jejunal homogenate (expressed as specific enzyme activity per mg of protein). GGPT maintained optimal activity in whole tissue homogenates stored for 50 days at -28C.

1024 THE MUSCULATURE OF THE DUODENAL WALL. II: ITS RELATION TO THE INTRAMURAL AUTONOMIC NERVOUS SYSTEM. *(It.)* Faggioli, F. (Inst. Spec. Med. Path., U. Bologna, Italy), N. Melchionda, F. Miglio, E. Roda and L. Gullo. *G Clin Med* 49(11):1117-1130, 1968.

A study was made of ultrastructural changes produced in duodenal mucosa of rats and man by electrical stimulation. This produced an electromotor response in the walls of the duodenum. Morphological changes in the mucosa consisted of an 80° rotation in the axis of polarity in epithelial cells, the appearance of small masses of osmophilic substance, and mitochondrial changes. These changes seem to show that electric current does not necessarily proceed via the shortest anatomical pathway, i.e. transmucosally, but follows the surface of the mucosa, presumably along smooth muscle fibers and nerve plexi. It is suggested that this route, while not the shortest, offers the least resistance to the passage of current, probably because of increases in metabolic exchanges along the covering membrane and between adjacent muscle and autonomic nerve fibers.

1025 TOPOGRAPHY OF THE PROXIMAL SEGMENT OF THE DUODENUM IN RELATION TO THE COMMON BILE DUCT AND THE GASTRODUODENAL ARTERY. *(Ser.)* Nikolic, V. (Inst. Human Anat., Med. Fac., U. Zagreb, Yugoslavia), V. Rudez, N. Ugarkovic, R. Budisavljevic and D. Kovacevic. *Lijecn Vjesn* 90(8):723-731, 1968.

Specimens of the duodenum, common bile duct, and ampulla of Vater from 75 patients (45 men and 30 women, 20-92 yr old) were studied to determine the normal configuration of the common bile duct and proximal duodenum; this configuration is felt to be a factor of considerable importance in preventing trauma to the biliary tract during gastrectomy. As found in earlier studies, the confluence of the cystic and hepatic ducts is well above the duodenum in about 48% of the cases, near the duodenal wall in 42%, and intramural or retropancreatic in 10%. In these 75 specimens, the retroduodenal segment of the common bile duct was 0.4-3.1 cm in length, the length of the hepatoduodenal connection was 3.0-5.5 cm, and the distances from the common bile duct to the pylorus, from the common bile duct to the middle of the duodenal arch, and from the pylorus to the gastroduodenal artery were 2.1-6.2 cm, 1.2-3.6 cm, and 1.9-5.8 cm, resp. It is suggested that simultaneous radiology of the biliary tract (i.v. Biligrafin) and digestive tract (barium) would enable potentially dangerous situations to be recognized before surgery is undertaken. Such a procedure is particularly indicated before surgery for perforated or chronic gastroduodenal ulcers, as well as in the presence of duodenal stenosis or deformation.

1026 SUBCELLULAR DISTRIBUTION OF THE ISOENZYMES OF NADP ISOCITRATE DEHYDROGENASE IN RAT LIVER AND HEART. *(E.)* Bell, J. L. (Royal Free Hosp., London, England) and D. N. Baron. *Enzym Biol Clin* 9(5):393-399, 1968.

The subcellular distribution of the isoenzymes of NADP-dependent isocitric dehydrogenase in heart and liver tissue was investigated in Wistar rats of both sexes. The soluble fraction of rat liver homogenate was found to contain 88% of the total isocitric dehydrogenase activity, even though this fraction contained only the fast isoenzyme while the microsomes and mitochondria contained both fast and slow isoenzymes; the nuclear fraction of rat liver homogenate contained only the slow form of isocitric dehydrogenase. The heart contained considerably more total isocitric dehydrogenase (600 U/ml/mg protein compared to 184 for the liver), but only 25% of it was in the soluble fraction while 63% was recovered in the mitochondria; however, only the soluble fraction contained both fast and slow isoenzymes while the particulate fraction contained only the slow form.

1027 MONOAMINOXIDASE, ACETYLCHOLINESTERASE AND HISTAMINASE IN THE INTESTINES OF DOMESTIC ANIMALS. *(Pol.)* Nagórna-Stasiak, B. (Dept. Anim. Physiol., WSR, Lublin, Poland). *Acta Physiol Pol* 19(6):935-947, 1968.

1028 FINE STRUCTURE AND DIMENSIONS OF INTESTINAL MICROVILLI DURING THE EARLY POST-INCUBATION PERIOD IN CHICKENS. *(E.)* Holman, J. (Sch. Vet. Med., Brno, Czechoslovakia). *Z Mikr Anat Forsch* 79(1):14-26, 1968.

1029 EFFECT OF AGE ON THE ASCORBIC ACID CONTENT OF THE LIVER OF *CALOTES VERSICOLOR*. *(E.)* Mohanty, M. K. (Zool. Dept., Ravenshaw Coll., Bhubaneswar, India) and B. K. Patnaik. *Experientia* 24(11):1129, 1968.

1030 ELECTRON MICROSCOPIC HISTOCHEMISTRY OF SUCCINIC DEHYDROGENASE IN THE DARK CELL OF THE CHICK LIVER. *(E.)* Yasuda, K. (Sch. Med., Keio U., Tokyo, Japan), K. Takano and T. Suzuki. *Okajima Folia Anat Jap* 45(4):183-189, 1968.

1031 EFFECTS OF AGE ON CELL PROLIFERATION IN MOUSE DUODENAL CRYPTS. *(E.)* Lesher, S. (Argonne Natl. Lab., Ill.) and G. A. Sacher. *Exp Geront* 3(3):211-216, 1968.

1032 CENTRIOLES IN HEPATOCYTES. *(E.)* Wheatley, D. N. (U. Med. Build., Aberdeen, Scotland). *Experientia* 24(11):1157-1159, 1968.

1033 THE EFFECT OF DIET ON THE CHOLINESTERASE ACTIVITY IN THE GASTRIC AND DUODENAL WALLS FROM THE POINT OF VIEW OF AGE. *(Rus.)* Donskaia, L. V. (Leningrad Sanit.-Hyg. Med. Inst., USSR), B. L. Smolianskii and I. I. Ushkova. *Vop Pitan* 27(5):26-29, 1968.

1034 ELECTRON AND LIGHT MICROSCOPIC IDENTIFICATION OF THE MAST CELL OF THE GASTROINTESTINAL TRACT. *(E.)* Dobbins, W. O. (VA Hosp., Durham, N. C.), J. T. Tomasini and E. L. Rollins. *Gastroenterology* 56(2):268-279, 1969.

1035 THE PHRENOESOPHAGEAL MEMBRANE. *(E.)* Strasberg, S. M. (U. Toronto, Canada) and M. D. Silver. *Surg Forum* 19:294-296, 1968.

See also: 1100,1177,1178,1298,1315,1635

1036 PRIMARY PORTAL TRANSPORT OF PERSORBED STARCH GRANULES FROM THE INTESTINAL WALL. *(E.)* Volkheimer, G. (1st Med. U. Clin., Charité Hosp., Berlin, Germany), F. H. Schulz, H. Lehmann, I. Aurich, R. Hübner, M. Hübner, A. Hallmayer, H. Münch, H. Oppermann and S. Strauch. *Med Exp* 18(2):103-108, 1968.

After fasting for 36 hr, 250 g of potato starch suspended in milk or meat broth was fed to 9 dogs (male and female, average weight 17 kg). Two hr later, animals were anesthetized, the splenic vessels were tied, and simultaneous blood samples were taken from the portal vein and the femoral artery at 10 min intervals from 130-210 min after feeding the starch meal. The number of starch granules in the blood samples was then determined microscopically. The ratio between the mean number of starch granules in the portal vein and the mean number of granules in the arterial blood was constant and independent of time, with the portal vein blood containing 29% more starch than the arterial blood in all samples. This indicates a primary portal transport of persorbed potato starch granules.

1037 FAT ABSORPTION IN RATS WITH AN INTESTINAL BLIND SEGMENT: AN ELECTRON MICROSCOPIC STUDY. *(E.)* Kjaerheim, A. (Dept. Path., U. Oslo, Norway) and K. Nygaard. *Scand J Gastroent* 3(3):225-233, 1968.

The fine structure of the intestinal epithelium was examined in starved and fat-fed adult male rats in which blind jejunal segments had been created 5 weeks previously. Rats were starved 12 and 24 hr prior to sacrifice, and 1 group received intragastric corn oil (1 ml) 1 hr prior to sacrifice. The majority of the epithelial cells in the blind segment appeared entirely normal. Little or no fat was visible in the cytoplasm of the epithelial cells after corn oil instillation. The epithelial cells proximal and distal to the blind loop were likewise normal. The fat content of epithelial cells in the blind segment of rats starved for 12 hr was less than in control rats (unoperated). In rats starved for 24 hr, the decreased fat content was even more marked. Above and below the blind loop, fat content was not statistically different from controls. If a toxic effect on the epithelium exists in the blind-loop syndrome, it is not manifested by ultrastructural changes.

1038 INTESTINAL ABSORPTION AND UTILIZATION OF RADIOMETHIONINE IN OLD AGE. *(E.)* Pénzes, L. (U. Med. Sci., Budapest, Hungary), G. Simon and M. Winter. *Exp Geront* 3(3):257-263, 1968.

Female Wistar rats of 3 different age groups (6 months, 14 months, and 26 months) were used to investigate the effects of age on the intestinal absorption and utilization of dl-methionine. The small intestine was exposed at both ends by 2 incisions and perfused with saline, followed by intraluminal injection of 1 ml of 9.45 x 10^4 cpm/ml dl-methionine-^{35}S (plus various amounts of inactive methionine)/100 g body weight. After 20 min, the radioactivity in the remaining intestinal fluid and in extracts from the intestine and liver was measured. Absorption of methionine was characterized by a rate-limiting process in which increasing initial intraluminal concentrations led to relatively lower absorption rates accompanied by percentile decreases of radioactivity in the liver and in the intestine itself, suggesting an active transport mechanism. The older animals (26 months old) showed a greater absorption of methionine than the younger animals. The increasing utilization of radiomethionine in the older animals was not followed by an increase of specific activity in the fat-free liver dry substance; however, the higher absorption rates resulted in an increase in the specific activity of liver protein. These results indicate an increased need for methionine and its derivatives during the aging process.

1039 STUDIES ON ABSORPTION AND EXCRETION OF DRUGS. XIII. THE SORPTION OF SURFACE ACTIVE AGENTS INTO THE INTESTINAL TISSUE OF RATS AND THEIR EFFECT ON DRUG ABSORPTION *IN VITRO*. *(E.)* Nogami, H. (Fac. Pharm. Sci., U. Tokyo, Japan), J. Hasegawa, M. Hanano and T. Fuwa. *Chem Pharm Bull* 16(11):2101-2106, 1968.

The kinetic behavior of ionic surfactants (sodium lauryl sulfate and cetyltrimethylammonium bromide) and their effect on drug absorption (nitrobenzene, o-methoxybenzaldehyde) above and below the critical micelle concentration (CMC) were investigated in intestinal segments isolated from fasting male Donryu rats. The sorption of both anionic cationic surfactants into the intestinal tissue was found to follow zero order kinetics above the CMC (1.0 mM and 0.4 mM, resp. at 37C) and first order kinetics below the CMC. The amount of surfactant which disappeared from the inner mucosal side of the solution during perfusion was due to uptake into the intestinal tissue and not to absorption through the intestinal wall. The observed zero-order rate constants were slightly larger than the calculated values for sodium lauryl sulfate and particularly for cetyltrimethylammonium bromide. Formation of sodium lauryl sulfate micelles did not affect the absorption of nitrobenzene below the CMC, but decreased absorption above the CMC. In contrast, the absorption of o-methoxybenzaldehyde was not affected by sodium lauryl sulfate micelle formation at any concentration. These studies demonstrate that micelle formation decreases the absorption of substances which are distributed over the micelle in significant amounts.

1040 STUDIES ON INTESTINAL SUCRASE AND SUGAR TRANSPORT. VII. A METHOD FOR MEASURING INTESTINAL UPTAKE, THE ABSORPTION OF THE ANOMERIC FORMS OF SOME MONOSACCHARIDES. *(E.)* Semenza, G. (Biochem. Inst., U. Zurich, Switzerland) and E. Mülhaupt. *Biochim Biophys Acta* 173(1):104-112, 1969.

A technique for measuring intestinal uptake of sugar is described and applied to the determination of the intestinal absorption of anomeric forms of some monosaccharides. Randomized segments of hamster intestine (rat or rabbit may also be used), pre-gassed in Krebs-Henseleit buffer, are mounted in a specially designed apparatus, exposing only the mucosal surface to the incubating medium. Sugar is added to the medium and at the end of the incubation period the tissue at the center of the apparatus is deproteinized and analyzed for sugar. This procedure allows adequate randomization of intestinal pieces, yields a small extracellular space and offers the possibility of exposing either the mucosa or the serosa, or both, to the medium. Since it permits very short incubation times (15-120 sec), unidirectional flow may be measured easily. Its disadvantages include the need for a relatively large volume of medium (20 ml) and the risk of tearing tissue from very young animals in the strong clamps employed. Using this technique, the intestinal uptake of the β-form of 6-deoxy-D-glucose was found to be greater than that of its α-form. No statistically significant differences were observed in uptake between the anomeric forms of D-glucose and 3-O-methyl-D-glucose. Some hypotheses concerning the role of sucrase and mutarotase during intestinal absorption of sugars are discussed.

1041 QUANTITATIVE ASPECTS OF INTESTINAL FAT ABSORPTION IN YOUNG PIGS. *(E.)* Freeman, C. P. (Unilever Res. Lab., Colworth House, Bedford, England), D. E. Noakes, E. F. Annison and K. J. Hill. *Brit J Nutr* 22(4):739-749, 1968.

The relative importance of micellar and particulate lipid absorption from the pig small intestine was studied *in vivo* by perfusing a loop of jejunum with radioactively labeled lipid in micellar or emulsified form; the rate at which lipid is presented to the small intestine under specific dietary regimens also was investigated in animals with reentrant fistulas in the duodenum and jejunum. The absorption of micellar lipid, prepared *in vitro* (1-^{14}C oleic acid) or isolated from a pig with a duodenal fistula (previously fed ^{3}H-oleic acid), was about 40 and 30% in jejunal loops of 2 animals compared to a very low uptake of particulate lipid (0.08 mg/min) when emulsified 1-^{14}C oleic acid was perfused through the isolated loop. The rate of uptake of micellar 1-^{14}C oleic acid varied linearly with the concentration of the micellar perfusate at a flow rate of 4.3 ml/min, increasing from 0.36 mg/min at 0.1 mg/ml to 2.50 mg/min at 2.0 mg/ml of lipid solution. No effect of concentration on the efficiency of absorption (about 25%) was observed. As the flow rate of micellar lipid solution increased from 2.1-4.3 ml/min, the uptake of labeled oleic acid rose proportionately (0.92 ± 0.14 to 1.81 ± 0.13 mg/min), but increasing the flow rate to 10.5 ml/min increased uptake to only 3.50 ± 0.07 mg/min. However, changes in flow rate had an appreciable effect on the efficiency of lipid absorption by the intestinal loop; at 2-4 ml/min absorptive efficiency was about 30% higher than at 10 ml/min. Studies in pigs with duodenal or jejunal reentrant fistulas indicated that periods of intensive digesta flow followed the ingestion of single standard, low- (2.7%) or high- (10%) fat diets; under these conditions absorptive efficiency may be reduced. No significant specificity was observed in the uptake of 1-^{14}C-labeled lauric, myristic, palmitic and stearic acids by intestinal loops when present in equimolar concentration in mixed micellar solution. A small preferential uptake of lauric acid compared to stearic acid occurred.

1042 SPECIFIC REQUIREMENT OF BILE SALTS FOR ABSORPTION OF CHOLESTEROL FROM THE INTESTINE. *(E.)* Suzuki, R. (Teikoku Hormone Mfg. Co., Kawasaki, Japan). *Keio J Med* 17(3):169-187, 1968.

Bile-fistula rats were fed various bile salts with 0.2 μC of cholesterol-4-^{14}C, 50 mg of nonradioactive cholesterol and 0.33 ml of oleic acid mixed with a fat- and sterol-free synthetic basal diet. The following recoveries of radioactivity were obtained in the bile: Na-cholate, 21%; Na-taurocholate, 45%; Na-glycocholate, 41%; Na-deoxycholate, 3.5%; and only traces with lithocholate, chenodeoxycholate, hyodeoxycholate, hyocholate, apocholate, dehydrocholate, or 3α, 12α-dihydroxy-7-ketocholanate. When taurocholate was fed with dehydrocholate, a 48% recovery was obtained. With oleic acid omitted, the percentage recovery was reduced to 6% with Na-cholate and 17% with Na-taurocholate. The absorbability of squalene was also compared with that of cholesterol in the intact rat by using the balance method; 44% of 61.5 mg of squalene and 58% of 50 mg of cholesterol were absorbed or not recovered in the feces. The simultaneous feeding of squalene and cholesterol resulted in approximately the same findings (42% and 54% absorption of squalene and cholesterol, resp.). In bile-fistula rats, only 5.6% of squalene was unrecovered in the feces, while feeding Na-taurocholate with squalene raised this figure to 25% and with cholesterol to 35%. No squalene was absorbed from the intestine of intact rats. It is concluded that cholesterol absorption requires bile salts possessing 7α- and 12α-hydroxyl groups simultaneously in addition to the 3α-hydroxyl group in the bile acid molecule. The mechanism of cholesterol absorption is tentatively described as diffusion through a lipoid sieve mediated specifically by cholate or its conjugates.

1043 THE TRANSMURAL POTENTIAL DIFFERENCE AND SHORT-CIRCUIT CURRENT ACROSS THE SMALL INTESTINE. *(E.)* Hajjar, J. J. (Sch. Med., Amer. U. Beirut, Lebanon), R. Nassar, H. Kurkjian and R. N. Khuri. *Comp Biochem Physiol* 28(2):717-724, 1969.

The transmural electrical potential difference and the short-circuit current were measured *in vitro* at corresponding sites along the length of the small intestine of 15 turtles (*Testudo graeca*), and the potential difference was also measured *in vitro* and *in vivo* in 8 cats and 7 rabbits. The mucosal side of the intestine was always negative and the serosal side positive in all cases. The mean potential difference (millivolts) in the jejunum, mid-intestine, and ileum in the turtle was 4.8, 4.2, and 4.6, resp. The corresponding values were 4.4, 3.9, and 4.3, resp., in rabbits and 3.2, 2.4, and 3.1, resp., in cats. The corresponding values for the *in vivo* experiments were 5.0, 5.6, and 5.6, resp., for rabbits and 6.2, 6.7, and 6.7, resp., for cats. Except for the significantly higher potential difference in the jejunum as compared to the mid-intestine in turtles and cats, none of the values were significantly different in the 3 animals studied.

1044 ROLE OF THE JEJUNUM IN THE ABSORPTION OF FOLIC ACID AND ITS POLYGLUTAMATES. *(E.)* Baker, H. (New Jersey Coll. Med. Dent., East Orange), A. D. Thomson, S. Feingold and O. Frank. *Amer J Clin Nutr* 22(2):124-132, 1969.

In 25 normal subjects, 25 with nutritional folate deficiency, 1 patient with small bowel resection leaving only 10 cm of jejunum, and 1 patient with a jejunectomy, plasma folate levels were determined before and 2, 4, 8, and 24 hr after the ingestion of synthetic folic acid (5 mg), synthetic folinic acid (10 mg), pteroyldiglutamate (6.5 mg), and pteroyltriglutamate (8.0 mg) on 4 separate occasions, with 1 week between each absorption test. Plasma folate levels were measured with *L. casei*, *S. faecalis*, and *P. cerevisiae*. All folates were well absorbed by the normal subjects and patients with nutritional folate deficiency. The patient who had only 10 cm of jejunum did not absorb any of the folates. The patient with the jejunectomy was able to absorb folic and folinic acid but was unable to absorb either of the pteroylpolyglutamates. These results suggest that a normal jejunum is necessary for the deconjugation of the pteroylpolyglutamates, which are the main folates found in foodstuffs; however, administered pteroylmonoglutamates (folic and folinic acid) can be absorbed through the small intestine even in the absence of the jejunum.

1045 MIGRATION OF ACETIC ACID AND SODIUM ACETATE AND THEIR EFFECTS ON THE GASTRIC TRANSMUCOSAL ION EXCHANGE. *(E.)* Flemström, G. (Inst. Physiol. Med. Biophys., U. Uppsala, Sweden) and B. Frenning. *Acta Physiol Scand* 74(4):521-532, 1968.

A significantly greater reduction in hydrogen ion concentration occurred on instillation of 6 ml of 170 mM acetic acid (HAc) into nonsecreting stomachs of anesthetized cats than during instillation of 6 ml 170 mM HCl. After instillation of HAc, the volume of intragastric solution decreased, probably due to the hypotonicity of the acid. The H^+ ion concentration decreased significantly more rapidly than the Ac^- concentration. An increase in combined sodium and potassium ion concentrations occurred which was significantly greater than the increase in the chloride ion concentration, indicating that apart from the molecular disappearance of HAc, there was an exchange between H^+ and Na^+-K^+ ions. The presence of a small amount of secretion in "spontaneously" secreting stomachs tended to mask this exchange. On instillation of 6 ml 170 mM sodium acetate solution into nonsecreting stomachs, the acetate disappeared more slowly than on instillation of HAc, and an acetate-chloride exchange occurred. Model experiments in which 12 ml 170 mM HCl or HAc was dialyzed against 4000 ml 170 mM NaCl across a cellophane membrane for 1 hr gave essentially the same results as instillations into cat stomachs, except that the disappearance rate of HAc was lower than that of HCl. These results indicate different mechanisms of migration of the acid through the gastric mucosa and the cellophane membrane. Studies with repeated instillations of HCl in cats demonstrated that the permeability effects of a 30 min instillation of 170 mM HAc were reversible and did not persist more than 90 min. Sodium acetate had a considerably smaller effect on the ionic permeability of the gastric mucosa. The permeability-increasing effect of acetic acid is probably related to intracellular dissociation of the diffusing acid with accumulation of ions, leading to transient intracellular pH reduction, intracellular hypertonicity and swelling of the mucosa.

1046 LIPOLYSIS AND ABSORPTION OF FAT IN THE RAT STOMACH. *(E.)* Clark, S. B. (St. Luke's Hosp. Ctr., New York, N. Y.), B. Brause and P. R. Holt. *Gastroenterology* 56(2):214-222, 1969.

Homogenates of gastric mucosa from Wistar rats in which contamination by pancreatic enzymes was excluded by prolonged pancreatic flow diversion (65 hr) were studied for triglyceride lipolytic activity. Hydrolysis of trioctanoin by gastric homogenates of diverted animals (51.7 ± 13.8 mμM/mg/hr) was significantly less than that of gastric homogenates of undiverted control rats (181.7 ± 16.2 mμM/mg/hr), while hydrolysis of triolein was barely measurable ($<$5.0 mμM/mg/hr) in both preparations. A broad pH optimum for gastric trioctanoin lipolysis (pH 6.3-7.0) was found. *In vitro* studies indicated that the enzyme was stable at pH 3.0 and regained full activity when incubated subsequently at pH 6.5. Sodium taurocholate (2-20 mM) did not alter the rate of trioctanoin hydrolysis by gastric homogenates *in vitro*, but did prevent loss of activity induced by 0.5% Tween 80. In pyloric ligated rats with prior pancreatic flow diversion considerable *in vivo* hydrolysis of both trioctanoin and triolein (about 1/8 to 1/10 that of trioctanoin) occurred, even at pH levels lower than 3.5. After an initial delay of 15 min, lipolysis occurred at a constant rate for at least 90 min and the rate of hydrolysis of trioctanoin and triolein was calculated to be 160 μM/hr and $<$20 μM/hr, resp. Significant absorption of octanoic acid-1-^{14}C was observed from the gastric lumen (about 45 μM/hr). In the presence of adequate amounts of pancreatic lipolytic enzymes, gastric enzymes are probably unnecessary for normal digestion and absorption of fat. In patients with pancreatic insufficiency or gastrojejunostomy, however, the gastric lipolytic enzyme may have a significant function, initiating fat digestion at the pH of the stomach and increasing the rate of lipolysis in the intestinal lumen.

1047 ALTERATION IN COBALT ABSORPTION IN PATIENTS WITH DISORDERS OF IRON METABOLISM. *(E.)* Valberg, L. S. (Kingston Gen. Hosp., Ontario, Canada), J. Ludwig and D. Olatunbosun. *Gastroenterology* 56(2):241-251, 1969.

The absorption of iron and cobalt was studied in healthy control subjects and in patients with iron deficiency or iron overload. In 12 controls administered 20 micromoles of $^{59}FeCl_2$ or $^{60}CoCl_2$ followed in 2 hr by 1.0 g of the unabsorbable marker, carmine red, average excretions of radioactivity in the feces with the marker were 64 and 54%, resp.; 9.0% of the iron compared to 2.0% of the cobalt was excreted after the dye disappeared from the feces. The average absorption of iron (27%) was significantly less than that of cobalt (44%). These observations suggest that the intestinal uptake of cobalt was greater than that of iron and that, unlike iron, cobalt is not sequestered and stored in the intestinal mucosa. Increased fecal excretion of cobalt occurred when 80 micromoles of carrier iron was given with 20 micromoles of cobalt and a similar increase in iron excretion was found when 80 micromoles of carrier cobalt was given with 20 micromoles of iron, indicating that iron and cobalt may compete for a similar uptake pathway in the intestinal mucosal cell. In 6 patients with iron deficiency the average excretions of ^{59}Fe and ^{60}Co with the marker were 37 and 25%, resp., compared to 3.0% and 1.8%, resp. following the marker. The average absorption of iron and cobalt, 60 and 71%, was significantly increased. Five patients with iron overload showed markedly increased excretion of iron with the marker (82%); but the average percentage excreted after the marker had disappeared (7.4%) was within the normal range. The excretion of cobalt both with and after the marker was similar to values in control subjects. The average absorption of iron (10%) was significantly reduced in these subjects, while the absorption of cobalt was normal. In 10 controls and 6 iron-deficient subjects a linear relation was observed between the mucosal uptake of iron and cobalt and also between the absorption of iron and cobalt. In 2 patients with portal cirrhosis associated with iron overload and in 4 patients with idiopathic hemochromatosis, the average absorption of iron and cobalt was significantly increased following 4 oral doses. These findings suggest that the intestinal mucosal transport of iron and cobalt involves a common pathway and that the acceleration of transport of both elements is regulated by the same mechanism. Cobalt absorption is apparently unaffected, however, by the physiological mechanisms that inhibit iron absorption.

1048 **THE PENETRATION OF IRON FROM THE MUCOSAL TO THE SEROSAL SURFACE AND VICE VERSA IN ISOLATED SEGMENTS OF THE JEJUNUM AND ILEUM FROM NORMAL AND IRON-DEFICIENT RATS.** *(Ger.)* Forth, W. (Inst. Pharmacol. Toxicol., U. Saar, Homburg, Germany), G. Leopold and W. Rummel. *Naunyn Schmiedeberg Arch Pharm Exp Path* 261(5):434-440, 1968.

Measurements were made of the rate of ^{59}Fe transport in both directions through everted sac preparations of the jejunum and ileum of normal and iron-deficient female Wistar rats, suspended in Tyrode solution. Iron deficiency was induced by feeding rats a diet of whole milk powder and corn starch and by withdrawing blood from their tongues. The rate of ^{59}Fe transport in both directions was directly proportional to iron concentrations between 10^{-5} and 10^{-8} M. The rate of ^{59}Fe transport from the mucosal to the serosal surface of the jejunum of normal animals was twice as fast as that through the terminal ileum. In anemic animals the rate of transport from the mucosal to the serosal surface of the jejunum was 3-20 times faster than in normal animals but was the same in the ileum of normal and anemic rats. The rate of ^{59}Fe transport from the serosal to the mucosal surface was 6 times faster than that in the opposite direction. The rate of transport was the same in the ileum and jejunum of both normal and anemic rats. It is suggested that differences in the rate of ^{59}Fe transport in different directions are due to greater contact between ^{59}Fe and the membranes and/or cytoplasm of the intestinal mucosa.

1049 **EXISTENCE AND CHARACTERISTICS OF Na^+-DEPENDENT ACTIVE TRANSPORT OF ASCORBIC ACID IN GUINEA PIG.** *(E.)* Stevenson, N. R. (Dept. Physiol., Rutgers Med. Sch., New Brunswick, N. J.) and M. K. Brush. *Amer J Clin Nutr* 22(3):318-325, 1969.

The mode of intestinal absorption of ascorbic acid was studied in the guinea pig. Rings of guinea pig distal small intestine incubated with 1 mM ascorbic acid for 15 min accumulated 0.86 ± 0.02 mM of the vitamin; the "endogenous ascorbic acid" content of tissue incubated without ascorbic acid in the medium was about 0.40 ± 0.01 mM. Thiourea (1 mM or 25 mM) added to the incubation medium failed to alter the degree of ascorbic acid absorption significantly. After 30 min of incubation in 0.5 mM dehydroascorbic acid medium, the tissue to medium concentration ratio was 0.33 ± 0.01 and 58 ± 12% of the total tissue ascorbic acid was ascorbic acid, while after 30 min of incubation in ascorbic acid medium containing 88 ± 2% ascorbic acid the corresponding values were 1.38 ± 0.04, and 94 ± 1%, resp. These findings indicate that ascorbic acid is the form of the vitamin which is transported across the mucosal epithelial cell and that dehydroascorbic acid enters at a much reduced rate. Absorptive activity varied along the gastrointestinal tract, with ileum segments showing the greatest activity and absorption against a concentration gradient. Anaerobic conditions and the presence of 0.5 mM dinitrophenol, 1.0 mM NaCN or 10 mM phlorhizin inhibited ascorbic acid uptake 51, 65, 50 and 40%, resp. There was a significant decrease in uptake of the vitamin when K^+ or $Tris^+$ replaced Na^+ in the medium, or when oubain was added to the incubation medium. Phlorhizin was not a competitive inhibitor of ascorbic acid transport. The presence of glucose (16.7 mM) in the incubation medium had no effect on absorption of ascorbic acid. It is concluded that the observed active transport of ascorbic acid satisfies all of the accepted criteria for a gradient-coupled, Na^+-dependent transport system similar to but distinct from that for sugars, and that it may represent a species-specific transport mechanism related to a species-specific nutrient requirement.

1050 **SOME ADDITIONAL CHARACTERISTICS OF METHIONINE TRANSPORT IN THE CHICKEN INTESTINE.** *(E.)* Lerner, J. (Agric. Res. Svc., U.S. Dept. Agric., Philadelphia, Pa.), V. Martin, C. R. Eddy and M. W. Taylor. *Experientia* 24(11):1103-1104, 1968.

The inhibitory effects of 0.1-0.9 mM L-ethionine on the transport of D-^{14}C- and L-^{14}C-methionine (0.1 mM) were investigated in 3-cm segments of small intestine removed from fasted white-Leghorn hens, 12-48 weeks old; the segments were incubated at 37C for 1 hr in oxygenated Krebs-Henseleit buffer containing 0.3% glucose, extracted with aqueous alcohol, and assayed for labeled methionine content by liquid scintillation techniques. The inhibitor-receptor site dissociation constants (K_i) for L-ethionine were 2.2 and 3.5 mM for D-methionine and L-methionine, resp. These values confirmed the equation $1/P = (K_i/100)(1 + S_1/K)(1/I) + 1/100$, where K = the apparent Michaelis constant; I = the inhibitor concentration; and P = the percentage of inhibition of substrate uptake. In other studies, tissue segments were incubated for 30 min with radioactive methionine, removed, and then reincubated with unlabeled methionine; the incubation media were assayed by liquid scintillation techniques. The results show that radioactive methionine loss from preloaded sections was accelerated when preloading was from a 1 mM L-methionine solution and when the unlabeled L-methionine solution was also 1 mM; if 0.1-mM solutions were used no acceleration was detected unless the concentration of unlabeled methionine was raised 10-fold. The infleunce of dinitrophenol on methionine loss was investigated as a function of time. The loss was more rapid during the first minute and continued at a rate about 3 times as high as that found with added dinitrophenol; almost total methionine loss occurred in the poisoned system within 50 min. The data support the hypothesis that energy coupling is needed to reduce the affinity of the substrate for its carrier on the inner side of the membrane.

1051 **VARIOUS FACTORS INFLUENCING THE DIGESTIVE UTILIZATION OF FATTY SUBSTANCES.** *(Fr.)* Thieulin, C. (Natl. Ctr. Zootech. Res., Jouy-en-Josas, France). *Ann Nutr (Paris)* 22(6):245-258, 1968.

1052 **PERFUSION STUDIES IN RELATION TO INTESTINAL ABSORPTION.** *(E.)* Sladen, G. E. *Gut* 9(6):624-628, 1968.

1053 **THE SITE OF IRON ABSORPTION IN THE GASTROINTESTINAL TRACT AS STUDIED BY A REMOTE-CONTROL INTESTINAL CAPSULE.** *(E.)* Hemmati, A. (Dept. Med., U. Bonn, Germany). *German Med Monthly* 13(12):569-573, 1968.

1054 **PLASMA RADIOACTIVITY FOLLOWING ORAL ADMINISTRATION OF ^{57}Co-LABELLED VITAMIN B$_{12}$.** *(E.)* Finney, R. D. and R. W. Payne. *Scot Med J* 13(12):428-429, 1968.

1055 **CURRENT CONCEPTS OF BILE ACID ABSORPTION.** *(E.)* Schiff, E. R. (U. Texas Southwest. Med. Sch., Dallas, Texas) and J. M. Dietschy. *Amer J Clin Nutr* 22(3):273-278, 1969.

1056 **DIETARY TRIGLYCERIDE COMPOSITION RELATED TO INTESTINAL FAT ABSORPTION.** *(E.)* Holt, P. R. (St. Luke's Hosp. Ctr., New York, N. Y.) and S. B. Clark. *Amer J Clin Nutr* 22(3):279-283, 1969.

1057 **A PERSPECTIVE OF DIGESTIVE-ABSORPTIVE FUNCTION.** *(E.)* Crane, R. K. (Rutgers Med. Sch., New Brunswick, N. J.). *Amer J Clin Nutr* 22(3):242-249, 1969.

1058 **MORPHOLOGIC ASPECTS OF LIPID ABSORPTION.** *(E.)* Dobbins, W. O. III. (VA Hosp., Durham, N. C.). *Amer J Clin Nutr* 22(3):257-265, 1969.

1059 **EFFECT OF BILE SALTS ON THE RATE OF FAT ABSORPTION.** *(E.)* Simmonds, W. J. (Dept. Physiol., U. Western Australia, Nedlands). *Amer J Clin Nutr* 22(3):266-272, 1969.

1060 **INSULIN AND INTESTINAL SUGAR ABSORPTION.** *(E.)* Fromm, D. (Harvard Med. Sch., Boston, Mass.). *Amer J Clin Nutr* 22(3):311-314, 1969.

1061 **COLONIC ABSORPTION OF ELECTROLYTES AND WATER.** *(E.)* Levitan, R. (New England Med. Ctr. Hosp., Boston, Mass.). *Amer J Clin Nutr* 22(3):315-317, 1969.

1062 **INTESTINAL ABSORPTION OF AMINO ACIDS: CURRENT CONCEPTS.** *(E.)* Spencer, R. P. (Yale U. Sch. Med., New Haven, Conn.). *Amer J Clin Nutr* 22(3):292-299, 1969.

1063 **INFLUENCE OF THE ENDOCRINE GLANDS ON SMALL INTESTINE ABSORPTION.** *(E.)* Gelb, A. (Mt. Sinai Sch. Med., New York, N. Y.) and C. D. Gerson. *Amer J Clin Nutr* 22(3):305-310, 1969.

1064 **EFFECT OF GASTRIN ON JEJUNAL WATER ABSORPTION.** *(E.)* Wright, H. K. (Yale U. Sch. Med., New Haven, Conn.), J. Kabemba and T. Herskovic. *Surg Forum* 19:282-283, 1968.

1065 **HORMONAL REGULATION OF BILE FLUID AND ELECTROLYTE COMPOSITION.** *(E.)* Peskin, G. W. (Michael Reese Hosp. & Med. Ctr., Chicago, Ill.), G. M. G. DaCruz and E. L. Kaplan. *Surg Forum* 19:346-347, 1968.

1066 **DISTRIBUTION AND KINETICS OF LABELLED VITAMIN B$_{12}$.** *(E.)* Flodh, H. *Acta Radiol (Stockholm)* 7(Suppl. 284):4-73, 1968.

See also: 1124,1176,1353,1357,1437,1588

1067 ESOPHAGEAL RESPONSES TO DISTENSION AND ELECTRICAL STIMULATION. *(E.)*

Christensen, J. (Dept. Int. Med., U. Iowa, Iowa City) and G. F. Lund. *J Clin Invest* 48(2):408-419, 1969.

The autonomic control of esophageal smooth muscle was studied by the use of 3 different preparations of opossum esophagus: esophagus *in vivo*, isolated whole esophagus, and isolated strips of the 3 layers of esophageal smooth muscle. Responses to localized distension and electrical stimulation were examined. Distension of the esophagus *in vivo* produced 3 different responses: 1) inflation of a distending balloon caused a brief contraction rostral to the point of distension (the on response); 2) maintenance of distension produced shortening of the esophagus sustained for the duration of distension (the duration response); and 3) deflation of the balloon caused a single brief caudal circumferential contraction, propagated caudad (the off response). These same effects were seen in the isolated whole esophagus with both the distending balloon and electrical stimulation. Electrical stimulation of isolated strips of the 3 muscle layers showed that the muscularis mucosae and the longitudinal layer of the muscularis propria always responded with a duration response only. The circular layer of the muscularis propria responded with on and off responses only. These observations suggest that both types of stimuli excite the same afferent nerve fibers in local reflex pathways. Peristalsis can be maintained by these reflexes in the smooth muscle part of the esophagus independent of central nervous connections.

1068 EFFECT OF ATROPINE AND DMAE (A HEMICHOLINIUM DERIVATIVE) ON CONTRACTILE RESPONSES OF THE GUINEA PIG ILEUM. *(E.)*

Goldenberg, M. M. (Norwich Pharmacal Co., N. Y.). *Canad J Physiol Pharmacol* 47(2):185-192, 1969.

The effects of atropine and α,α'-bis(dimethylammoniumacetaldehyde diethylacetal)-p,p'-diacetylbiphenyl bromide (DMAE) on the response of the isolated guinea pig ileum to ganglionic stimulants and to transmural stimulation were investigated *in vitro*. Nicotine and 1,1-dimethyl-4-phenylpiperazinium iodide (DMPP), caused initial spike-like contractions, which were blocked by atropine, followed by a slow sustained contraction, which was atropine-resistant but was inhibited by DMAE. Cocaine and morphine, unlike DMAE, did not elicit a differential antagonism of the biphasic effects of the ganglionic stimulants. Contractions evoked by transmural stimulation, however, were augmented by DMAE but reduced by cocaine and atropine. DMAE might induce ileal contractions by means of intrinsic excitation of the cholinergic neuronal elements and not by a direct action on cholinergic smooth muscle receptors. It is concluded that ganglionic stimulants have revealed an atropine-resistant noncholinergic neuronal pathway in the guinea pig ileum which is sensitive to DMAE blockade. The actions of DMAE and cocaine on the contractions caused by ganglionic stimulants and transmural stimulation are not parallel in character.

1069 THE EFFECT OF VAGOTOMY ON THE HUMAN GASTROOESOPHAGEAL SPHINCTER. *(E.)*

Mann, C. V. (London Hosp., England) and J. D. Hardcastle. *Gut* 9(6):688-695, 1968.

The effect of vagotomy on esophageal sphincter pressures and deglutition was studied in 14 duodenal ulcer patients. In 9 patients studied 10-14 days after surgery, a significant drop in pressure immediately below the diaphragm was found by open-tip examination. No changes in sphincter pressure were found by small balloon studies, and deglutition responses were unaffected. In 4 patients studied more than 1 yr after surgery, no significant changes in sphincter pressure were found in comparison to preoperative controls (15), and deglutition responses were normal. The results show that the reflux reported to occur after vagotomy is not caused by a drop in esophageal sphincter pressures as a consequence of the operation. The reduction in sphincter pressure noted in the first group just below the hiatus may be a consequence of division of the phrenoesophageal ligament during mobilization of the lower esophagus. The minimal changes in sphincter pressures observed after vagotomy and the absence of any change in deglutition responses demonstrate that the abdominal vagus nerves do not play a major role in maintaining or controlling the human gastroesophageal pressure barrier.

1070 INTRALUMINAL PRESSURE STUDIES AT DIFFERENT DISTANCES FROM THE ANUS IN NORMAL SUBJECTS AND IN PATIENTS WITH THE IRRITABLE COLON SYNDROME. *(E.)*

Ritchie, J. A. (Nuffield Dept. Clin. Med., Oxford, England) and M. S. Tuckey. *Amer J Dig Dis* 14(2):96-106, 1969.

Parameters of intraluminal pressure in the human rectum and pelvic colon were recorded at different distances from the anal margin in a total of 56 observations in 25 normal subjects and compared with measurements taken from 183 observations in 98 patients with the irritable colon syndrome. The latter group was divided into those with painless diarrhea, those with spastic colon in whom colonic pain was the chief symptom, and those with both pain and diarrhea. The pattern of localized motor activity found in patients with painless diarrhea resembled that seen in normal subjects. There were also similarities between the curves for the group with the spastic colon and the group with mixed symptoms; these were significantly different from those obtained from normal subjects and patients with painless diarrhea. The findings tend to differentiate a consistently painless diarrhea from the remainder of the irritable colon syndrome.

1071 ANTICHOLECYSTOKININ ACTIVITY IN THE WALLS OF THE GALLBLADDER AND COMMON BILE DUCT: AN EXPERIMENTAL STUDY. *(It.)*

Vezzadini, P. (1st Inst. Spec. Med. Path., U. Bologna, Italy), G. Fontana and P. Azzaroli. *G Clin Med* 49(11):1161-1172, 1968.

Homogenates and acetone extracts of fragments from the gallbladder and extrahepatic biliary tract of male rabbits were incubated at 37C with 0.5 mg of cholecystokinin for 20 min, after which the cholecystokinin and anticholecystokinin activities of the mixture were determined by biological titration in guinea pig gallbladders *in situ*. Most of the anticholecystokini activity was located in the neck and body of the gallbladder although some was also found in the fundus and cystic duct. These findings suggest that disorders in the motility of the biliary tract, particularly postcholecystectomy syndrome and some types of primary and secondary biliary dyskinesia, are due to a deficiency or excess of anticholecystokinin.

1072 **ANTRAL MUSCLE SENSITIVITY AFTER VAGOTOMY IN THE RAT.** *(E.)* Bremner, C. G. (Gen. Hosp., Johannesburg, South Africa). *S Afr Med J* 43(5):114-118, 1969.

Antral contractile activity in the rat was evaluated 5-66 days after vagotomy in longitudinal muscle strips from the greater curvature of the stomach (including pyloric muscle) and in isolated stomach preparations perfused under pressure with Tyrode's solution. Muscle strips from normal and vagotomized animals (5, 12 or 30 days after surgery), but not from sham-operated animals, showed spontaneous contraction. The response of the strips to acetylcholine was as good in the vagotomized as in the normal unoperated specimens, and better than in the sham-operated strips. Pressure recordings of perfused stomachs showed markedly increased antral motility after vagotomy and a significant response to acetylcholine stimulation as compared with sham-operated stomachs. However, there was minimal change in antral activity following electrical stimulation *in vitro* of stomach preparations from vagotomized rats. These observations suggest that a slight increase in muscle sensitivity occurs after vagotomy, combined with some pyloric dysfunction, resulting in a mechanical obstruction to outflow at the pylorus.

1073 **ELECTROMYOGRAPHY OF THE COLON *IN SITU*: AN EXPERIMENTAL STUDY IN MAN AND IN THE RABBIT.** *(E.)* Couturier, D. (Bichat Hosp., Paris, France), C. Roze, M. H. Couturier-Turpin and C. Debray. *Gastroenterology* 56(2):317-322, 1969.

The spontaneous, low-frequency electrical activity of the pelvic colon in 12 normal human subjects, recorded by a mucosal electrode introduced per rectum, was compared with that recorded from electrodes attached to the serosal surface of the colon in 9 male rabbits. In humans, slow-wave sequences varying in duration from 20 sec to 3 min were recorded during 5% of the total observation period. The average frequency of the recorded slow waves was 9.9 cycles/min (8.4-10.6) and the average amplitude was 0.48 mvolts (0.18-1.0). Slow wave activity was also independent of the patient's age. Spike potentials recorded in bursts of 203 sec duration were seen less often than the slow waves. The frequency of the bursts of spike potentials corresponded to that of the slow waves, but spike potentials were not confined to a single phase of the slow waves; luminal pressure of the colon (as observed in the small intestine). In the rabbit, slow-wave electrical activity was recorded during 6% of the observation period, varying in duration from 30-90 sec with an average frequency of 13.8 cycles/min and an average amplitude of 0.4 mvolts. Recordings made from the mucosal surface in the rabbit agreed with those from the serosal surface. The similarity between the slow-wave activity recorded from both preparations is evidence that this activity arises in the muscle of the colon, presumably resulting from synchronous electrical activity of groups of muscle cells. Further studies are necessary to establish the location and propagation of slow waves in the colon and to relate this electrical activity to muscular contraction.

1074 **EXPERIMENTAL RADIOCINEMATOGRAPHIC STUDY OF GASTROESOPHAGEAL REFLUX IN MAN.** *(Fr.)* Boutelier, P. (U. Hosp. Ctr., Paris, France), A. Behar, P. Tschantz and F. Heitz. *Arch Franc Mal Appar Dig* 57(11):909-916, 1968.

Gastroesophageal reflux was induced in 20 patients with no esophageal abnormalities (12 men and 8 women, aged 17-83 yr) by passing an aspiration tube through the hiatus. Reflux was greatest in subjects over 40 yr old, probably because of changes in the tonus of the cardia and diaphragmatic pillars with age. Mild hypotonia was observed in 2, and no change in tonus in 3, of the 5 subjects with minimal reflux. None had anomalies in esophageal peristalsis. Of the 7 subjects with moderate reflux, all had some esophageal hypotonia combined with delays in the passage of barium and esophageal dilatation. In addition, changes were seen in esophageal peristalsis in 5 cases (tertiary waves in 3 and spasms in 2). Peristaltic changes were usually accompanied by considerable hypotonia. Esophageal hypotonia was present in all 8 subjects with severe reflux, and anomalies in peristalsis were seen in 7 (tertiary waves in 6 and spasms in 1). Reflux and hypotonia persisted after withdrawal of the tube in 4 subjects and tertiary waves persisted in 1 (an 83-yr-old woman).

1075 **GASTROINTESTINAL EFFECTS OF METOCLOPRAMIDE IN MAN: *IN VITRO* EXPERIMENTS WITH HUMAN SMOOTH MUSCLE PREPARATIONS.** *(E.)* Eisner, M. (U. Med. Clin., Munic. Hosp., Basel, Switzerland). *Brit Med J* 4(5632):679-680, 1968.

The effects of metoclopramide (N-(diethylaminoethyl)-2-methoxy-4-amino-5-chlorobenzamide; 0.1-100 μg/ml) on human gastrointestinal smooth-muscle preparations was investigated *in vitro*. Small-intestinal and colonic circular muscle was contracted by metoclopramide; this effect was antagonized by atropine. Gastric and colonic longitudinal muscle was sensitized to acetylcholine by metoclopramide, and in this case atropine was a partial antagonist of metoclopramide. The interference between acetylcholine and metoclopramide is of a previously undescribed pharmacological type, involving the existence of 2 different but mutually interfering receptors for the contraction of smooth muscle. Metoclopramide had no effect on the relaxation or contraction induced by isoprenalin or serotonin. The effects of metoclopramide *in vivo*, where its action is predominantly on the stomach and pylorus, are not fully explained by these *in vitro* experiments in which the effect was most pronounced on the colon.

1076 **INTESTINAL MOTILITY IN DOMESTIC FOWL.** *(Pol.)* Nagórna-Stasiak, B. (Dept. Anim. Physiol., WSR, Lublin, Poland) and M. Pytasz. *Acta Physiol Pol* 19(6):949-960, 1968.

1077 **TRACER STUDY OF GASTROINTESTINAL TRANSIT IN ABDOMEN-IRRADIATED RATS.** *(E.)* Bouckaert, A. (Cancer Inst., U. Louvain, Belgium). *Radiobiol Radiother (Berlin)* 9(5):567-572, 1968.

See also: 1083,1201,1210,1211,1299,1316,1447

1078 **SECRETORY POTENTIALS IN RAT SUBMAXILLARY GLAND.** *(E.)* Schneyer, L. H. (U. Alabama Med. Ctr., Birmingham) and Y. Yoshida. *Proc Soc Exp Biol Med* 130(1):192-196, 1969.

Secretory potentials from submaxillary gland acinar cells were studied in Long-Evans adult rats surgically prepared for microelectrode recording. Bipolar electrodes were placed on the cannulated main excretory duct of the gland for stimulation of chordi tympani fibers running along the duct (parasympathetic stimulation), and electrodes were also placed around the common carotid artery or the superior cervical ganglion (sympathetic stimulation). Repetitive electrical stimuli of 10-20 cycles/sec at 2-8 volts (5 msec duration) were used to evoke secretory potentials. Stimulation of either the parasympathetic or sympathetic innervation evoked secretory potentials which were small in magnitude and inconstant in form. Either hyperpolarization or depolarization occurred with stimulation of either the sympathetic or parasympathetic innervation separately. It is suggested that more than 1 ionic shift occurs across the membrane during stimulation and that the form of the potentials depends upon an algebraic balance of ion movements at any 1 time.

1079 **CURRENT IDEAS AS TO THE DIRECT PARTICIPATION OF THE GASTROINTESTINAL TRACT IN METABOLISM.** *(Rus.)* Shlygin, G. K. (Inst. Nutrit., Acad. Med. Sci. USSR, Moscow). *Vestn Akad Nauk SSSR* 23(12):27-33, 1968.

See also: 1114

1080 THE EFFECT OF PROTEIN PRODUCTS ON GASTRIC SECRETION IN DOGS. *(Rus.)* Storozhuk, P. G. (Kuban Med. Inst., Krasnodar, USSR). *Vop Pitan* 27(5):50-55, 1968.

Gastric secretion was measured in 6 dogs with Pavlov pouches for 6 hr after feeding various foods containing equal amounts of protein. The largest volumes of gastric juice were produced by feeding egg yolk, followed by meat and fish, egg white, and milk protein. Secretion of acid and pepsin followed similar patterns. Egg yolk was by far the strongest stimulant of any food tested. It produced a 2-6 fold increase in the volume of gastric juice secreted, a 3-11 fold increase in acid secretion, and a 2.5-7.5 fold increase in pepsin secretion.

1081 INHIBITION OF GASTRIC SECRETION IN THE RAT WITH SODIUM OLEATE. *(E.)* Rochman, N. D. (Long Island Jewish Hosp., New Hyde Park, N. Y.), P. E. Lear, L. Picker and C. Mandell. *J Surg Res* 9(4):213-215, 1969.

Solutions of oleic acid (0.1 and 0.2N), linoleic acid (0.1N), stearic acid (0.1N), and propionic acid (0.1N), adjusted to pH 8 with NaOH, were given i.v. and i.p. to male Wistar rats previously fasted for 48 hr, and the effect on gastric secretion was measured 4 hr later by the method of Shay. Both i.v. and i.p. sodium oleate showed significant suppression (by 1/3) of the volume of gastric acid secretion as compared to saline-injected controls, whereas the propionate, linoleate, and stearate solutions had no significant effect. It is concluded that sodium oleate may have a specific pharmacological effect on gastric secretion in the rat.

1082 A GASTRIC FISTULA PREPARATION TO STUDY SECRETION IN THE INNERVATED STOMACH. *(E.)* Sanders, R. J. (U. Colorado Med. Ctr., Denver). *Surgery* 65(3):447-453, 1969.

An innervated gastric fistula preparation was made in dogs by inserting a plastic cannula into the gastric antrum and bringing it out to the abdominal wall. Maximal histamine studies were then performed using the cannula to collect samples. The reproducibility of these studies was comparable to similar studies in dogs with isolated Heidenhain pouches. The fistula preparation did not lose significant fluid and electrolytes because secretions were collected for only 1-2 hr/day. It is felt that this preparation provides a better long-term preparation for the study of the effects of vagotomy on gastric secretion than is presently available.

1083 SELECTIVE AND TOTAL VAGOTOMY WITHOUT DRAINAGE: A COMPARATIVE STUDY OF GASTRIC SECRETION AND MOTILITY IN DOGS. *(E.)* Shiina, E. (U. Washington Sch. Med., Seattle) and C. A. Griffith. *Ann Surg* 169(3):326-333, 1969.

Five adult mongrel dogs equipped with Heidenhain pouches underwent selective vagotomy at a 1st stage and total vagotomy at a 2nd stage. Before and after each stage, gastric emptying was measured by barium meals and gastric secretion was measured by 24-hr pouch collections. The completeness of the vagotomy was determined by insulin tests after selective vagotomy and after total vagotomy by the electrical vagal stimulation method in the presence of circulating neutral red. Pouch secretions increased only slightly after selective vagotomy whereas large increases were seen after total vagotomy. This difference, as determined by studies of secretions from the main stomach and gastrointestinal motility, could not be explained by any differences in completeness of gastric vagotomy or decrease in secretion from the main stomach or gastrointestinal stasis. It was postulated that these differences may be due to inhibition of gastric secretion by the hepatic and celiac vagi. The mechanisms of this inhibition, however, are unknown.

1084 ACID SECRETION IN GUINEA PIGS WITH CHRONIC GASTRIC FISTULAS. *(E.)* Ragins, H. (Albert Einstein Coll. Med., Bronx, N. Y.) and F. Wincze. *J Surg Res* 9(4):217-221, 1969.

Guinea pigs with chronic gastric fistulas were developed to fill the need for a small-animal preparation in which acid secretion could be stimulated and monitored reliably for long periods of time. A titanium cannula for the gastrostomy was devised having the form of a collar button with a double flange near the base and a fenestrated end flange on the surface of the stomach for suturing the stomach wall. A small Teflon screw was used to plug the cannula when collections were not being made. The cannula was located near the center of the greater curvature of the stomach and brought out high posteriorly near the vertebral column. All animals were declawed to prevent removal of the cannula. Based hourly volumes ranged from 0-5 ml and rarely approached 10 ml; the free acid ranged up to 90 mEq/liter. Stimulated hourly volumes (Histalog) ranged up to 16 ml and the free acid concentration ranged up to 127 mEq/liter. Dose-response curves for Histalog s.c. showed a leveling off at a range of 5.44-8.16 mg/kg/hr. Continous maximal stimulation of acid secretion in the unanesthetized unrestrained guinea pig was achieved by cementing an electrolyte microflow pump to the shaved back of the animal. Animals were shown to survive and function well for up to 9 months with this preparation.

1085 GASTRIC SECRETION AND INTRAVENOUS INJECTION OF POTASSIUM. *(E.)* Link, E. (Med. Clin., U. Erlangen-Nuremberg, Germany) and R. Ottenjann. *Digestion* 1(5):277-288, 1968.

The influence of parenteral potassium on both basal gastric seretion and gastric secretion submaximally stimulated by histamine was determined in a total of 35 normal male subjects (mean age 42 yr). Gastric juice samples were collected by gastric intubation. In the basal secretion studies, 20 subjects received 15 mEq potassium as a 1 M KC1 solution in 200 ml 5% fructose i.v. over 1 hr; blood samples were obtained before and at 30 and 60 min intervals after the start of the infusion in order to determine the serum K level. In the stimulated secretion studies, 15 subjects received 12 μg histamine/kg over a 2-hr period, and 15 mEq K as 1 M KC1 solution in 50 ml 5% fructose over a 1 hr period beginning 1 hr after the start of the histamine infusion. It was noted that K infusion stimulated basal secretion; the rate of secretion of H, C1, K, and Na showed a significant increase. Parenteral K had no effect on H, C1, K, or Na secretion rates during histamine stimulation; however, the H concentration increased significantly. During and after the K infusion, the gastric secretion of K as compared to the secretion of H increased significantly. When the results were used to calculate the nonparietal component of gastric secretion, a value of 6.5 ml/15 min was determined as the nonparietal basal secretion.

1086 **EFFECT OF CORTICOTROPIN ON GASTRIC ACID, PEPSIN, AND MUCUS SECRETION IN DOGS WITH FISTULAS.** *(E.)* Sun, D. C. H. (VA Hosp., Phoenix, Ariz.). *Amer J Dig Dis* 14(2):107-112, 1969.

In 6 dogs prepared with esophagostomies and gastric fistulas, weekly studies of gastric secretion, including volume, acid and pepsin output, and mucus chemical composition, were performed during an 8-week basal period and during an 8-week test period in which ACTH (40 U i.m.) was given daily. At the end of the 1st week of the test period, gastric secretion increased by an average of 260% over the basal period, acid output increased from 0.45 mEq/hr during the basal period to 2.98 mEq/hr, while pepsin secretion was unaffected. The average protein, hexosamine, and sialic acid outputs did not differ significantly during the 2 periods of observation. However, a significant decrease in the fucose output (from 18.5 μM/3 hr during the basal period to 13.1 μM/3 hr after the 1st week of the test period) was noted; significant decreases in the stoichiometric molar ratios of fucose to hexosamine and to sialic acid were likewise noted. The alteration in the neutral and acidic mucopolysaccharides of the gastric mucus secreted during ACTH administration may indicate an impairment of the gastric mucosal barrier.

1087 **CANINE GASTRIC AND PANCREATIC SECRETION DURING INTESTINAL DISTENSION AND INTESTINAL PERFUSION WITH CHOLINE DERIVATIVES.** *(E.)* Sum, P. T. (Dept. Exper. Surg., McGill U., Montreal, P. Q., Canada), H. L. Schipper and R. M. Preshaw. *Canad J Physiol Pharmacol* 47(2):115-118, 1969.

In order to determine whether the 2 functionally and structurally similar hormones, gastrin and cholecystokinin-pancreozymin, are released by similar stimuli originating in the intestinal lumen, dilute solutions of acetylcholine or bethanechol in 0.15 M NaCl were infused into the duodenum of 3 mongrel dogs prepared with chronic gastric and pancreatic fistulas. Solutions were infused at a rate of 60 ml/hr (acetylcholine 17 μg/ml and bethanechol 0.4 μg/ml) for 30 min; the dose was doubled over the next 30-min period. Controls received saline alone. Gastric and pancreatic secretions were collected at intervals during the infusions. In other experiments, the intestine was distended for 90 min by a balloon filled with 0, 30, 60, and 90 ml of water. In 6 experiments, infusion of acetylcholine caused a small increase in gastric acid output, but had no effect on pancreatic protein output, flow rate, or bicarbonate output. Higher concentrations of acetylcholine caused restlessness with reddening of the intestinal mucosa. Infusion of saline alone for a similar period of time also caused a slight increase in gastric acid output without increasing pancreatic secretion. Bethanechol infusion increased both gastric acid output and pancreatic protein output, with a smaller increase in flow rate and bicarbonate output. In 24 experiments, balloon distension of the duodenum increased gastric acid output but had no effect on pancreatic flow rates or output with no evidence of inhibition of pancreatic secretion after distension. When bethanechol was given in the same dose i.v., the same results, but to a greater degree, were observed. It is concluded that the introduction of acetylcholine or bethanechol solutions into the duodenum or balloon distension of the duodenum has little effect on pancreatic secretion.

1088 **EFFECTS OF COMMERCIAL PANCREOZYMIN PREPARATION (CECEKIN) AND GASTRIN PENTAPEPTIDE UPON ACID AND PEPSIN SECRETION IN GASTRIC FISTULA DOGS.** *(E.)* Venables, C. W. (Mount Si Sinai Sch. Med., New York, N. Y.), J. Rudick, A. E. Kark and D. A. Dreiling. *J Surg Res* 9(2):55-60, 1969.

The effects of a commercial preparation of pancreozymin-cholecystokinin (Cecekin), containing a small amount of secretin, and of gastrin pentapeptide on gastric acid and pepsin secretion were studied in 4 dogs with gastric fistulas. Continuous i.v. infusion of 0.5-4 U/kg/hr of Cecekin stimulated acid secretion, but the amount of stimulation and dose at which peak output occurred varied with each dog (coefficient of variability=105%). There was an overall 3-fold increase in acid secretion over basal levels. Variation in response (coefficient of variability=39%) among dogs given gastrin pentapeptide (0.75-6 μg/kg/hr i.v. was less and peak output occurred at a dose of 3 μg/kg/hr in 3 of 4 animals. The maximal secretion obtained with gastrin pentapeptide was 6.68 compared to 2.92 μEq/20 min for Cecekin. With methacholine (125 μg/kg/hr) added to the infusion a 14% increase in maximal acid output occurred with gastrin pentapeptide, while the increase was about 80% with Cecekin. Pepsin secretion was equally stimulated by both drugs; an overall 3-fold increase in pepsin output over basal levels was observed. Addition of a constant methacholine background enhanced pepsin output in response to both secretagogues equally. In general, there was little difference in the peak response to the 2 drugs, even when potentiated by methacholine. With Cecekin the peak chloride output was 45% and the peak potassium output was 47% of that noted for gastrin pentapeptide. The addition of methacholine increased chloride and potassium outputs and reduced the difference between the response to the 2 drugs.

1089 **INCORPORATION OF RADIOSULFATE IN THE GASTRIC MUCOSA OF THE RAT SUBJECTED TO RESTRAINT.** *(E.)* Lambert, R. (Edouard-Herriot Hosp., Lyon, France), C. Andre and F. Martin. *Gastroenterology* 56(2):200-205, 1969.

Carrier-free ^{35}S as sodium sulfate (100 μC) was injected i.p. into 22 male Wistar rats subsequently subjected to 24 hr of restraint in a metal tube and into 22 control animals. Gastric ulcers were observed at the end of 24 hr in 13 of 22 restrained rats and in none of the controls. Homogenates of stomach mucosa and muscular layer were prepared and digested by pepsi for 24 hr. In the gastric mucosa the total nondialyzable radiosulfate did not vary significantly between controls and restraint animals without ulcers (93.8% of controls), but significantly decreased radiosulfate incorporation (60.2% of controls) was observed in rats with ulcers following restraint. Results were similar for the nondialyzable fractions precipitable and not precipitable by cetyl-pyridinium chloride. In the muscular layer the nondialyzable radiosulfate did not vary significantly among the 3 groups of rats. Further studies are needed to determine whether the observed depression of sulfate incorporation is a cause or a result of the gastric ulcers.

1090 EXPERIMENTAL HYPERPARATHYROIDISM: EFFECTS ON GASTRIC SECRETION. *(E.)*
Fischer, J. E. (Massachusetts Gen. Hosp., Boston) and R. F. Gittes. *J Surg Res* 9(2):49-53, 1969.

Gastric acid secretion was studied in inbred male Fischer-344 rats made hyperparathyroid by i.m. transplantation of 40 isologous parathyroid glands and in normal rats given bovine parathyroid extract (200 U/100 g twice at 12-hr intervals i.m.) or partially purified porcine thyrocalcitonin (20 U i.v.). The gastric secretory response to a hypertonic sucrose test meal was unchanged on the 1st day following the parathyroid transplantation, but declined on the 2nd postoperative day and remained very low for 4 days. This inhibition corresponded to the period of marked hypercalcemia (up to 14 mg/100 ml) which occurred after parathyroid transplantation. After the 8th day gastric secretion returned to normal and remained so for at least 4 weeks. The observed inhibition of gastric secretion was not a nonspecific result of operative trauma or anesthesia, since sham-operated animals failed to demonstrate such an altered response to the test meal. In contrast, significant gastric acid hypersecretion occurred 3 hr after the 2nd injection of parathyroid extract, suggesting that there is a separate action of the bovine extract which is unrelated to hypercalcemia. One hr after the administration of thyrocalcitonin the gastric secretory response to a glucose meal was slightly diminished. If the association of hyperparathyroidism and peptic ulcer disease is one of cause and effect, gastric secretion may not be the most important causative factor.

1091 EFFECTS OF SC 15396 ON GASTRIC SECRETION. PART II. INHIBITORY EFFECT OF SC 15396 ON STIMULATED CANINE GASTRIC SECRETION AFTER SURGICAL PROCEDURES. *(E.)* Macleod, I. B. (U. Edinburgh Med. Sch., Scotland) and R. A. Hill. *Gut* 9(6):644-649, 1968.

The effect of 2-phenyl-2-(2-pyridyl)-thioacetamide (SC 15396) on gastrin-, insulin- or histamine-stimulated gastric secretion was studied in conscious dogs with gastric fistulas, complete antrectomy with gastroduodenal anastomosis, and Heidenhain or Pavlov pouches. Injection of 50 mg SC 15396 i.v. produced prompt, highly significant inhibition of established gastrin II-stimulated (0.5 μg/kg/hr) secretion in gastric-fistula and Heidenhain and Pavlov pouch dogs and delayed and depressed new secretion when given 15 min before the start of gastrin infusion in gastric fistula dogs. Orally administered SC 15396 (100 mg), after a 30-min delay (presumably required for absorption), caused marked inhibition of gastrin-stimulated secretion for 2-3 hr in dogs with both types of pouch; the inhibition lasted at least 3 hr with 200 mg SC 15396. Injection of SC 15396 (50 mg i.v.) in gastric-fistula dogs 15 min before, simultaneously with or 10 min after insulin (0.15 U/kg) depressed secretion 45-90%. In dogs with antrectomy, i.v. SC 15396 (50 mg) markedly inhibited or completely blocked the scanty secretion induced by insulin. Histamine-stimulated secretion was much more resistant to the effect of SC 15396; 50 mg i.v. had no significant effect on maximal histamine-stimulated secretion (90 μg/kg/hr), but 200 mg p.o. markedly inhibited histamine-stimulated secretion in Heidenhain pouch dogs. Oral SC 15396 (200 mg) produced greater inhibition of secretion in the histamine-stimulated Pavlov pouch preparation. The duration of inhibition was prolonged with the large oral dose of SC 15396 (up to 6 hr). In gastric-fistula dogs, 200 mg SC 15396 p.o. or intragastrically 60 min before infusion of histamine (2.0 mg/hr) did not significantly depress gastric secretion. Administration of 200 mg SC 15293 i.v., however, promptly and significantly inhibited secretion and no toxic effects were observed.

1092 EFFECTS OF SC 15396 ON GASTRIC SECRETION. PART III. THE ACTION IN THE RAT. *(E.)* Thomson, C. G. (West. Gen. Hosp., Edinburgh, Scotland) and W. Sircus. *Gut* 9(6):649-654, 1968.

In a modification of the urethan-anesthetized, male Wistar rat preparation described by Lai (*Gut* 5:327, 1964), maintained at 34C, i.v. 2-phenyl-2-(2-pyridyl)-thioacetamide (SC 15396; 0.75-3.5 μg) decreased or completely abolished the normal secretory response to gastrin II (0.3-1.2 μg) when administered before or immediately after the test dose of gastrin. The drug was more effective in depressing the induction of gastrin-stimulated secretion than in inhibiting already established secretion. An adequate molar ratio of drug to secretagogue was necessary to produce inhibition. This ratio had to be above 50 x 10^4 to block gastrin-stimulated secretion that had already begun, and the drug had to be administered immediately after the test dose of hormone. The molar ratio required to prevent gastrin-stimulated secretion when the drug was given prior to the hormone was less than 50 x 10^4. Individual variation in sensitivity to SC 15396 was observed. Based on these results and those obtained in dogs, it seems unlikely that SC 15396 is a specific gastrin antagonist.

1093 EFFECTS OF SC 15396 ON GASTRIC SECRETION. PART I. INHIBITION OF CANINE GASTRIC SECRETION BY COMPOUND SC 15396 GIVEN ORALLY AND PARENTERALLY. *(E.)* Connell, A. M. (Dept. Surg., Queen's U. Belfast, Northern Ireland). *Gut* 9(6):641-644, 1968.

The effect of 2-phenyl-2-(2-pyridyl)-thioacetamide (SC 15396), a new compound with a powerful inhibitory effect on gastric secretion, was investigated in dogs with total gastric fistulas following stimulation with histamine, insulin or pentagastrin. A single i.v. injection of 20 mg (1 mg/kg) of SC 15396 dissolved in 2 ml of dimethyl sulfoxide produced a prompt and marked decrease in the acid secretory response to a constant infusion of pentagastrin (15 μg/hr), but a less marked and shorter-lasting reduction in acid secretion stimulated by a constant infusion of histamine (1.0 mg/hr). Intragastric administration of SC 15396 (20 mg/kg) markedly suppressed the acid response to s.c. pentagastrin (5 μg/kg) given 1 hr previously, but failed to prevent the acid response to a maximal stimulus of s.c. histamine administered 1 hr previously. SC 15396 also markedly reduced the acid response previously established by a constant infusion of pentagastrin (and maintained by 0.066 μg/kg/min of pentagastrin); there was a linear relation between the dose of SC 15396 and the reduction in acid secretion (89% at 20 mg/kg, 68% at 10 mg/kg, 57% at 5 mg/kg body weight). With submaximal pentagastrin stimulation (0.0075 μg/kg/min), a dose of 10 mg/kg SC 15396 achieved 85% reduction in acid secretion and an intragastric dose of 1 mg/kg produced a 33% reduction. Intragastric SC 15396 (2 mg/kg) also depressed the acid secretory response to 0.2 U/kg of insulin given 1 hr previously s.c.

1094 ANTIGASTRIC SECRETORY ACTIVITY OF 4-CHLORO-α,α-DIMETHYLPHENETHYLAMINOPROPAN-2-ONE AND RELATED COMPOUNDS. *(E.)* Lippman, W. (Ayerst Labs., Montreal, P. Q., Canada). *Experientia* 24(11):1153-1155, 1968.

Pylorus-ligated Charles River female albino rats (170-190 g) were used to test the antisecretory effects of 4-chloro-α,α-dimethylphenethylaminopropan-2-one (AY 14,948) and related compounds; the effects of α,α-dimethylphenethylaminopropan-2-one (AY 18,672) and imipramine on reserpine-stimulated gastric acid secretion were also investigated. AY 14,948 (20 mg/kg i.p.) inhibited basal gastric secretion 56%, while the structurally-related compounds AY 18,672 and AY 20,214 (4-chloro-α,α-dimethylphenethylaminopropan-2-ol) inhibited secretion 76 and 58%, resp.; AY 20,213 (the dechlorinated analog of AY 20,214) had no effect on gastric acid secretion. When the drug dosage was decreased by 50%, AY 14,948 and AY 18,672 inhibited gastric acid secretion 26 and 62%, resp., while AY 20,214 and AY 20,213 proved ineffective. Thus, AY 18,672 exhibited the most potent antisecretory activity. Reserpine (5 mg/kg s.c.) increased free and total acid output by 317 and 306%, resp. When AY 18,672 (10 mg/kg s.c.) and imipramine (10 mg/kg s.c.) were given 15 min before reserpine, free and total acid outputs were similar to those of control animals; AY 18,672 and imipramine thus inhibit reserpine-induced gastric acid secretion.

1095 CRYSTALLINE STRUCTURES IN SECRETION FROM GASTRIC FUNDUS GLANDS. *(E.)* Helander, H. F. (Dept. Anat., U. Umeå, Sweden). *Exp Cell Res* 54(2):150-156, 1969.

In Sprague-Dawley rats and rat fetuses from the 20th day of gestation to adulthood (but not in 16-19 day-old embryos), a substance of moderate-to-high density was observed by electron microscopy in the lumens of the fundus glands and in the intracellular canaliculi of the parietal cells. This material was more frequently found in young rats from birth up to 10 days of age. In fasted animals of this age range, the substance exhibited 3 different crystalline patterns. The first form displayed regularly spaced particles, approx. 50 Å, aligned in 2 sets of parallel rows at about right angles to each other. The distance between rows was about 75 Å in both planes. The 2nd pattern exhibited alternating parallel dense and less dense lines with a center-to-center distance of about 105 Å. In the 3rd form, dense 50 Å particles were regularly spaced in 3 planes at about a 60° angle to each other; the center-to-center distance between the particles in this hexagonal lattice was about 75 Å. Transitional forms between these 3 main patterns and irregular variations in the structure within a crystal also were frequently observed. In unfasted rats no crystalline pattern was found in the luminal material. Selected area diffraction on thin sections of the crystals did not result in any specific pattern and polarization microscopy failed to reveal any birefringence. These observations suggest that the unit cell is a 105 Å face-centered cube. The material contained within the crystals is probably secreted by the parietal cells, and may include mucus.

1096 MAGNESIUM IN THE GASTRIC JUICE AS STUDIED BY MEANS OF ATOMIC ABSORPTION SPECTROPHOTOMETRY. *(Pol.)* Hankiewicz, J. (1st Clin. Int. Dis., Silesian Acad. Med., Katowice, Poland). *Pol Arch Med Wewn* 41(5):619-626, 1968.

Absorption spectrophotometry (absorption at 295.2 nm) was used to determine the Mg content of the gastric juice in 22 healthy subjects and 78 patients with various gastroduodenal disorders. In healthy subjects, the average Mg concentration was 0.81 ± 0.59 mEq/liter or 1.0 ± 0.72 mg% (range 0.15-3.2 mg%), which is only about half the normal serum level and only one sixth the concentration of Ca in the gastric juice. Following administration of histamine, there was a temporary increase in the Mg concentration to 1.3 mg%, followed by a gradual drop to 0.55 mg%; the Mg secretion following histamine generally paralleled that of acid and calcium. The Mg concentration of the gastric juice averaged 1.4-1.7 mg% in patients with gastric or duodenal ulcers, 2.0 mg% in cancer of the stomach, and only 0.7 mg% following gastrectomy. It was essentially normal in patients with alcoholic gastritis, hypochlorhydria or hyperchlorhydria.

1097 THE ROLE OF THE INTESTINES IN THE REGULATION OF GASTRIC SECRETION. *(Pol.)* Konturek, S. (1st Clin. Int. Dis., Acad. Med. Krakow, Poland). *Pol Tyg Lek* 24(8):267-270, 1969.

In 15 patients with duodenal ulcers (27-45 yr old), gastric acid secretion was maintained at a half-maximal level by a continuous i.v. infusion of Histalog (0.2 mg/kg/hr), and variations in secretion were measured during small-intestinal dilatation or instillation of 0.1 N HC1 or a micellar fat suspension (25 mM monoglyceryl dioleate in dilute human bile) into the duodenum, jejunum or ileum. Instillation of HC1 inhibited gastric secretion by about 50%, but only when the acid was introduced into the duodenum, while instillation of micellar fat or mechanical dilatation inhibited gastric secretion by about 30-40% at all levels of the small intestine. It is concluded that the small intestine can control gastric secretion via two different mechanism one responding to acid in the duodenum and the other responding to a fatty meal or mechanical dilatation at any level of the small bowel.

1098 EFFECT OF DIABETES OF VARYING DEGREES OF SEVERITY ON THE GASTRIC SECRETION IN RESPONSE TO HISTAMINE IN DOGS. *(Rus.)* Genes, S. G. (Khar'kov Inst. Endocrinol., USSR) and N. G. Lesnoi. *Pat Fiziol Eksp Ter* 12(6):43-47, 1968.

1099 GASTRIC SECRETION FOLLOWING NEONATAL SURGERY. *(E.)* Hyde, G. A. Jr. (Child Hosp., San Francisco, Calif.). *J Pediat Surg* 3(6):691-695, 196

1100 EFFERENT SECRETORY VAGAL INNERVATION OF THE ANTRUM. *(E.)* Legros, G. (U. Washington Sch. Med., Seattle), E. Shiina and C. A. Griffith. *Surg Forum* 19:320-321, 1968.

1101 EFFECTS OF AN ANTIGASTRIN COMPOUND ON INDUCED GASTRIC HYPERSECRETION IN DOGS. *(E.)* Tucker, K. R. (Marquette Sch. Med., Milwauk Wis.), S. D. Wilson, W. J. Schulte and E. H. Ellison. *Surg Forum* 19:275-276, 1968.

102 SIMILARITY OF ACTION OF PENTAGASTRIN AND PANCREOZYMIN-CHOLECYSTOKININ N THE ISOLATED STOMACH AND PANCREAS. *(E.)* avidson, W. D. (Harbor Gen. Hosp., Torrance, Calif.), O. rushibara and J. C. Thompson. *Surg Forum* 19:277-278, 1968.

1103 EFFECT OF NERVE FUNCTION INHIBITORS ON PENTAGASTRIN STIMULATED ACID ECRETION BY ISOLATED BULLFROG GASTRIC MUCOSA. *E.)* Urushibara, O. (Harbor Gen. Hosp., Torrance, Calif.), . D. Davidson and J. C. Thompson. *Surg Forum* 19:279-80, 1968.

1104 ANTIGASTRIN SUPPRESSION OF GASTRIN, HISTAMINE, AND VAGAL GASTRIC SECRETION. *(E.)* Tiongco, R. (U. Florida Coll. Med., Gainesville), . Isaza, K. Sugawara and M. M. Eisenberg. *Surg Forum* 19: 80-282, 1968.

1105 EFFECT OF ASPIRIN ON THE INCORPORATION OF GLUCOSAMINE INTO GASTRIC MUCUS. *(E.)* Reed, N. P. (Albany Med. Coll., Union U., Albany, N. Y.), J. A. Balint and S. R. Powers Jr. *Surg Forum* 19:286-288, 1968.

1106 INFLUENCE OF ASPIRIN ON THE TURNOVER RATE OF GASTRIC MUCOSAL CELLS. *(E.)* Max, M. H. (U. Chicago Sch. Med., Ill.) and R. B. Menguy. *Surg Forum* 19:288-290, 1968.

1107 EFFECT OF HYPOKALEMIA ON GASTRIC SECRETION. *(E.)* Nicoloff, D. M. (VA Hosp., Minneapolis, Minn.). *Surg Forum* 19:292-294, 1968.

1108 SPECIFICITY OF ANTIGASTRIN IN THE SUPPRESSION OF GASTRIC SECRETION. *(E.)* Newman, P. H. (Harbor Gen. Hosp., Torrance, Calif.), J. H. Miller and J. C. Thompson. *Surg Forum* 19:273-275, 1968.

See also: 1046,1201,1202,1267,1306,1316,1389,1390,1401,1403

1109 THE ASSAY OF SECRETIN IN THE RAT.

(E.) Heatley, N. G. (Sir William Dunn Sch. Path., U. Oxford, England). *J Endocr* 42(4):535-547, 1968.

On the basis of several thousand secretin assays by Love's method, the characteristics of the rat pancreas which are pertinent to the assay of secretin are discussed, along with the stability and potency of certain secretin standards. Assays were performed on Wistar rats, but Hooded, Long-Evans and Fisher strains gave similar results. Quantitatively similar responses were obtained under urethan or ether anesthesia. The maximum rate of pancreatic flow and the time required to reach it were found to be roughly proportional to the logarithm of the secretin dose. The response (i.e., the extra secretion resulting from the administration of secretin) over a small range appeared to be linearly related to the dose, but over a more extended range it was nearly proportional to the logarithm of the dose. Response was unaffected by changes in basal rate of secretion. Male rats tended to give larger responses to secretin than females. Fluctuations in response to the same dose of secretin sometimes occurred during the course of an assay and could not be related to factors such as diet, age, sex, body weight, plane of anethesia, body temperature, or noxious agents in the solutions assayed. Erratic flow of bile into the duodenum had no effect on rate of flow of pancreatic juice or bile or on the response to secretin, whereas 0.5 ml 0.1 N HCl caused increased flow of pancreatic juice. Division of both vagi at the level of the esophagus produced no effect on magnitude or duration of response. Responses depended in part on mean blood pressure. The amount and concentration of bicarbonate was found to be increased after administration of either secretin or pure cholecystokinin-pancreozymin. The flow rate during a response period depended on the length of that period. The coefficient of variation for a single determination of secretin was found to be 15.6% when standard and unknown were compared in the same rat. Secretin showed no ecbolic effect in the rat, but pure cholecystokinin-pancreozymin had a strong hydrelatic action. It appears that secretin cannot be assayed accurately in the rat (or cat) in the presence of unknown amounts of pancreozymin. Little change in activity occurred with Love's Secretin Standard 'LHP 18' which has been used as a standard since 1955, but the value of the Hammarsten Cat Unit and of the Swedish Clinical Unit which is based on it were found to be substantially different in 1967 compared to 1962.

1110 THE ASSAY OF PANCREOZYMIN, AND OF SECRETIN AND PANCREOZYMIN SIMULTANEOUSLY, IN THE RAT.

(E.) Heatley, N. G. (Sir William Dunn Sch. Path., U. Oxford, England). *J Endocr* 42(4):549-557, 1968.

A flushing procedure is described by which it is possible to collect rat pancreatic secretion formed during a given period almost quantitatively. A steady infusion of 30 μl 0.9% NaCl solution is perfused through a curved cannula at the hepatic end of the common duct during the 45-sec flushing operation; a second cannula, inserted as close as possible to the duodenal end of the common duct, drains the secretion. Secretion continues during the flushing period. Preliminary studies in which flushing was performed by hand gave erratic results and suggested the need for a completely steady delivery of fluid to the inlet cannula and application of negative pressure to eliminate the rise in intraductal pressure which occurs during flushing. Since the protein in pancreatic juice is largely enzymic, the collected secretion is analyzed for enzyme content indirectly in terms of absorption at 278 mμ. Anesthetizing the rats with i.m. urethan 3-4 hr before surgery prevented the gradual fall in protein output which normally occurs after the operation. Basal protein output in terms of body weight was greate in males than in females. Measurable responses in protein output occurred with 0.1 Crick-Harper-Raper Unit of pancreozymin, which is about 1/10 the dosage of the working range. Sensitivity to pancreozymin changed during the experiment in at least 2 of 16 rats studied. Secretin (270,000 Hammarsten Cat Units (HCU)/mg) at a dose of 4.4 HCU produced a mean increase in protein output of only 0.172 ± 0.155 absorption units; no ecbolic effect was observed. Both pure and 50% pure pancreozymin gave marked increases in the volume of pancreatic juice and in amount and concentration of bicarbonate. A procedure is proposed for the assay of pancreozymin, or secretin and pancreozymin simultaneously.

1111 ENERGY SOURCES FOR PROTEIN SYNTHESI AND ENZYMATIC SECRETION IN RAT PANCREAS *IN VITRO.*

(E.) Bauduin, H. (Sch. Med., U. Brussels Belgium), M. Colin and J. E. Dumont. *Biochim Biophys Acta* 174(2):722-733, 1969.

The relative contribution of glycolysis and oxidative phosphor lation to rat pancreas energy metabolism was evaluated *in vitr* and the relations between energy metabolism and pancreatic secretion or protein synthesis were studied. Incubation of rat pancreas fragments in Krebs-Ringer Tris-HCl-buffered medium enriched with glucose and amino acids provided a metabolic steady state, as shown by linearity of respiration, amino acid incorporation into proteins and enzyme release, for more than 2 hr. Mitochondria accounted for more than 90% of the energy output of the pancreas. Aerobic glycolysis provided less than 10% of the energy of the pancreas, but the role of glyco lysis increased 3-fold in anaerobiosis. Carbamylcholine (0.1 mM) and pancreozymin (0.6 U/ml) increased chymotrypsinog and amylase secretion and oxygen uptake (the effects were correlated) and did not significantly modify lactic acid formation, but incorporation of L-(^{3}H)leucine into proteins was strongly inhibited. Various inhibitors of respiration and glyco lysis inhibited leucine incorporation into proteins and reduced the nucleoside triphosphate level in the gland: amino acid incorporation was 38, 36, 15, 7 and 4% of control values and t nucleoside triphosphate level was 60, 40, 36, 15 and 8% of control values in the presence of oxamate, oligomycin, oligomycin plus oxamate, or antimycin, and during anaerobiosis, resp. These data support the view that the action of these inhibitors on amino acid incorporation is secondary to their effects on the energy supply, suggesting that protein synthesis by the pancreatic cell depends on a common pool of ATP supplied by glycolysis and oxidative phosphorylation. Anaer biosis and oligomycin plus oxamate inhibited carbamylcholin induced secretion, but oligomycin alone or oxamate alone ha no effect. This observation suggests that stimulated secretion requires an ATP supply, if not an increase of ATP generation The spontaneous release of chymotrypsinogen was reduced b ntimycin, oxamate plus anaerobiosis or oligomycin combined vith oxamate, which strongly depress ATP output, indicating hat the retention of enzymes in the cell is also dependent on minimal energy supply.

112 **ETHANOL INGESTION AND INCORPORATION OF ^{32}P INTO PHOSPHOLIPIDS OF ANCREAS IN THE RAT.** *(E.)* Orrego-Matte, H. (J. J. guirre Hosp., U. Chile, Santiago), E. Navia, A. Feres and L. Costamaillere. *Gastroenterology* 56(2):280-285, 1969.

he incorporation of ^{32}P into pancreatic phospholipids was tudied in the following groups of rats: (a) normal; (b) chronic thanol ingestion (4.8 g/kg/day for 75 days); (c) acute ethanol ngestion (4.8 g/kg/day twice); (d) chronic glucose administraion via intragastric tube in amounts isocaloric to the ethanol n group b; (e) chronic saline administration via intragastric ube (1.5 ml/day for 75 days); (f) vagotomized; and (g) sham perated. The effect of stimulation with β-methylcholine (1.25 ng s.c.) was investigated in normal control rats, in rats subected to chronic ethanol administration, and in vagotomized ats. Acute or chronic ethanol ingestion produced significantly ower ^{32}P incorporation into pancreatic phospholipids. The dministration of β-methylcholine abolished this difference vhen given to rats with chronic ethanol ingestion; however, -methylcholine had no effect on ^{32}P-incorporation in normal ats. Ethanol withdrawal for 7 days in the group with acute thanol ingestion allowed a return to normal ^{32}P-incorporation vhereas a withdrawal period of 27 days was needed in the hronic ethanol ingestion group before an increase in ^{32}P-incororation was noted (but not to normal levels). Vagotomy reluced the ^{32}P-incorporation, while this effect was not noted in he sham operated controls. After β-methylcholine was given o the vagotomized rats, an increase in the incorporation levels vas achieved, but normal values were not reached. It is possible hat ethanol interferes with a cholinergic mechanism necessary or normal ^{32}P-incorporation into pancreatic phospholipids.

113 **RESPIRATION AND BILIARY AND EXOCRINE PANCREATIC SECRETION: EFFECTS OF PRETHCAMIDE.** *(Fr.)* Debray, C. (Bichat Hosp., Paris, France), J. de la Tour, C. Vaille, C. Roze and M. Souchard. *Lille Med* 13(10):1108-1116, 1968.

The output of pancreatic juice and bile was measured in rats with biliary and pancreatic fistulas before and after administration of 15 or 30 mg prethcamide i.v., 5 ml Grande-Grille Vichy water i.v., or a combination of prethcamide and Vichy water. The output of pancreatic juice was increased slightly by both doses of prethcamide, Vichy water alone, and Vichy water combined with prethcamide. Neither of the drugs nor their combination increased the protein concentration of pancreatic juice, but the protein output was increased by Vichy water, 30 mg prethcamide, and prethcamide with Vichy water. Significant increases in amylase output and amylase concentrations occurred with Vichy water alone and Vichy water with prethcamide. Both doses of prethcamide had a very strong choleretic action which was significantly reduced by Vichy water. Although prethcamide initially produced a significant reduction in the bile bilirubin concentration, after 3 hr a great increase occurred in bilirubin output and the total quantity of bilirubin secreted. Administration of Vichy water in combination with prethcamide reduced bilirubin output after an initial increase. Administration of Vichy water alone produced only a slight increase which was significant for only 1 hr after injection. These findings are compared with results previously obtained with caffeine and heptaminol.

1114 **ISOENZYMES OF AMYLASE.** *(Fr.)* Wettendorff, P. (Ixelles Hosp., Belgium), A. Dumont and A. Delcourt. *Acta Gastroent Belg* 31(11):731-737, 1968.

1115 **THE FUNCTION OF THE EXOCRINE PANCREAS.** *(E.)* Taylor, J. H. (London Hosp., England). *Brit J Hosp Med* 1(2):156-158, 1968.

1116 **THE ISOLATION OF PORCINE RIBONUCLEASE, A GLYCOPROTEIN, FROM PANCREATIC JUICE.** *(E.)* Reinhold, V. N. (Brookhaven Natl. Lab., Upton, N. Y.), F. T. Dunne, J. C. Wriston, M. Schwarz, L. Sarda and C. H. W. Hirs. *J Biol Chem* 243(24):6482-6494, 1968.

See also: 1011,1087,1102,1143,1528,1581

1117 THE EFFECT OF GASTRIC ANTRAL STIMULATION UPON THE SECRETION OF HEPATIC BILE. *(E.)* Ross, H. (Harvard Med. Sch., Boston, Mass.), A. Saubermann and W. Silen. *Proc Soc Exp Biol Med* 130(1):278-283, 1969.

Seven cholecystectomized dogs were prepared with completely separated, vagally denervated, antral pouches and gastrojejunstomies. A duodenal cannula was placed opposite the opening of the common bile duct in each animal. In 3 of these dogs, a Heidenhain pouch was also constructed whereas in the other 4 animals a gastric cannula was placed in the ventral wall of the stomach. Biliary volume and composition were studied by catheterization of the common bile duct during constant i.v. infusion of 2% sodium taurocholate to maintain an intact enterohepatic circulation of bile salts. In the dogs with Heidenhain pouches or when the gastric cannula was closed, perfusion of the antral pouch with buffered 4% choline chloride solution at pH 7.5 caused highly significant increases in biliary volume, HCO_3^- concentration and output, Cl^- concentration and output, and total outputs of Na, K, bile salts and bile solids. The concentration of Na and K was unchanged but the concentration of total bile salts and solids was decreased. When the gastric cannula was opened, none of these effects were observed and there were no significant changes from the control values in biliary volume or composition. These studies indicate that the effect of endogenous gastrin on hepatic bile flow during artificial maintenance of the enterohepatic circulation of bile salts is predominantly an indirect one resulting from the entrance of acid into the small intestine.

1118 RIBONUCLEIC ACID SYNTHESIS IN RELATION TO PRECURSOR POOLS IN REGENERATING RAT LIVER. *(E.)* Bucher, N. L. R. (Huntington Mem. Hosp., Harvard U., Massachusetts Gen. Hosp., Boston) and M. N. Swaffield. *Biochim Biophys Acta* 174(2):491-502, 1969.

(6-^{14}C)-Orotic acid and (2-^{14}C)-cytidine were used to illustrate the difficulties encountered when RNA biosynthesis during the early stages of hepatic regeneration is estimated without consideration of 2 factors which significantly influence the rate of RNA synthesis: 1) reduction of effective liver mass by the surgery (gradually reversed by regenerative activity), and 2) enlargement of the endogenous precursor pools. Modified techniques are discussed which allow estimation of RNA biosynthetic rates in terms of mμmoles of nucleoside triphosphate incorporated. Evaluation of RNA synthesis under conditions which permit adjustments for alterations in liver mass and in the quantity of endogenous RNA precursors yield more consistent results under various experimental conditions and may more nearly approximate the actual rates of RNA synthesis *in vivo*. Applying the modified procedures, expansion of the uridine triphosphate pool was found to be an early event in regeneration; increases of 50% occurred in both fed and 12-hr-fasting rats within 3 hr after partial hepatectomy. Cytidine triphosphate levels were one third those of uridine triphosphate and increased more gradually. RNA synthesis was initially depressed immediately after partial hepatectomy in both fed and fasting animals, rose by 50-100% at 3-6 hr, and then remained level for 6 more hr. The increase in biosynthetic rate lagged behind the expansion of the uridine triphosphate pool in the fasting but not in the fed rats. RNA liver content followed a similar course, rising sooner in the fed than in fasting animals. Sham hepatectomized rats showed minor transient increases in pool size, biosynthetic rate and RNA content.

1119 STUDIES ON TWO TYPES OF ALKALINE PHOSPHATASE IN RAT LIVER. *(E.)* Kaneko, A. (Sapporo Med. Coll., Japan). *J Biochem (Tokyo)* 64(6):785 794, 1968.

The intracellular distribution of 2 types of hepatic alkaline pho phatase (AP) and their response to ligation of the bile duct wer studied in adult male Wistar rats. While the Mg^{++}-insensitive AP activity increased in the lysosomal and especially in the nuclear (10-fold) and microsomal (8-fold) fractions on the 1st day after ligation, and remained at these levels for about 3 weeks, the activity of the Mg^{++}-sensitive AP in the supernatant fluid did not vary for 21 days following ligation. EDTA 1x1-$^{-3}$M), KCN (1x10^{-3}M) and deoxycholate (7x10^{-3}M) inhibited Mg^{++}-insensitive AP in the particulate fraction of cells prepared 1 day after biliary ligation, but NaF (1x10^{-2}M) had n effect; EDTA inhibition was partially alleviated by $MgCl_2$. Similar results were obtained with partially purified AP extracted from the nuclear and microsomal fractions. The AP activit in the supernatant fluid was inhibited only by NaF. DEAE-cellulose column chromatography demonstrated the existence of both Mg^{++}-sensitive and Mg^{++}-insensitive AP. The Mg^{++}-insensitive type was extremely labile and the relative activities in the 2 peaks varied with the type of eluting solution, the age of the enzyme solution and the temperature. Both enzyme types had similar K_m values, but Mg^{++}-insensitive AP was active even at acidic pH levels.

1120 LIVER CELL FRACTIONS WHICH STIMULATE INCREASE OF AN ACUTE PHASE PROTEIN IN THE RAT. *(E.)* Darcy, D. A. (Royal Cancer Hosp., London, England). *Brit J Exp Path* 49(6):614-624, 1968.

As a model of what occurs *in vivo* when tissue damage results in a sudden increase in synthesis of rat serum α_1-glycoprotein (acute-phase globulin), various fractions of homogenized liver cells from hooded rats were injected s.c. into CB rats and the increase in the specific serum globulin was determined after 24 and 48 hr. At least 75% of the total activity of the cell wa found to reside in the cytoplasm. Microsomes showed the high est activity, followed closely by the supernatant; the mitochondrial fraction showed less activity and the lysosome fraction wa least effective in eliciting an α_1-glycoprotein response. It was not clear why all cell fractions demonstrated activity. Howeve since even sucrose and buffer solutions elicited an increase in serum glycoprotein levels, the occurrence of a nonspecific or secondary effect must be postulated. Attempts to characterize the stimulating factor liberated from disrupted cells revealed that the substance was nondialyzable from the superpatant and could be precipitated from the supernatant at pH 5, suggesting a protein. Within the microsome fraction, the factor was more strongly associated with the membranous portion than with th ribosomes, but experiments with sodium deoxycholate and ED failed to differentiate clearly between the membranes and the ribosomal portions of the microsome fraction. The protein-stimulating activity was not weakened by ribonuclease treatment.

121 **FATTY LIVERS, ADENOSINE TRIPHOSPHATE AND ASPARAGINE.** *(E.)* Chew, B. K. (Yale U. ch. Med., New Haven, Conn.), N. M. Alexander, R. Scheig and . Klatskin. *Biochem Pharmacol* 17(12):2463-2469, 1968.

he effect of L-asparagine on hepatic triglyceride and ATP lev- ls was investigated in fasting Sprague-Dawley rats following ad- inistration of ethionine, carbon tetrachloride (CCl_4) or ethanol. imultaneous i.p. injection of asparagine (0.2 g/100 g body eight) and ethionine (0.1 g/100 g) almost completely prevented he 3.5-fold increase in hepatic triglyceride and 70% decrease in epatic ATP produced by ethionine alone. This same concen- ration of asparagine also prevented the 3-fold increase in tri- lyceride and 40% reduction in ATP produced by 0.2 ml CCl_4/ 00 g body weight s.c. and the 50% decrease in ATP resulting rom 0.5 ml/100 g CCl_4 administered by stomach tube, but ad no effect on the 6-fold increase in hepatic triglyceride in- uced by the higher dose of CCl_4. Oral asparagine (0.2 g/100) was effective in preventing the 36 and 77% decline in hepatic TP produced by 0.5 and 0.75 g/100 g body weight ethanol y stomach tube, resp. in female rats, but did not prevent the ccumulation of hepatic triglyceride induced by either dose 6-fold and 9-fold increases, resp.). Larger doses of asparagine 0.4 g/100 g) prevented the fall in ATP in male rats given .5 g/100 g ethanol, but again failed to protect against the ac- umulation of triglyceride. At 0.2 g/100 g, asparagine only artially reversed the hepatic ATP depletion and the fatty liver ersisted. Hepatic ATP depletion and inhibition of lipoprotein ynthesis may not account for the fatty infiltration produced y these agents.

1122 **DIETARY AND HORMONAL INFLUENCES ON RAT LIVER POLYSOME PROFILES: FAT, GLUCOSE AND INSULIN.** *(E.)* Wittman, J. S. III (Tulane U. Sch. Med., New Orleans, La.), K. L. Lee and O. N. Miller. *Biochim Biophys Acta* 174(2):536-543, 1969.

Analysis of polysome profiles (distribution of ribosomal aggregates by size) from the livers of rats fasted for 60-65 hr showed that refeeding glucose restored the polysome profile within 10 hr. Refeeding glucose for 4 hr or less was without effect. Refeeding isocaloric amounts of fat to fasted animals produced essentially no change in the degree of polysome aggregation. Alloxan-induced diabetes (40 mg/kg i.v.) caused no significant change in polysome profile 1 week after alloxan treatment, but in 14-18 days the polysomes were disrupted approximately the same amount as in a nondiabetic rat fasted for 60 hr. Insulin treatment (10 IU i.p.) restored the heavy polysomes of the alloxan-diabetic rats within 1 hr. However, only rats that had been diabetic for 18 days or less showed restoration of the profile approximating the polysome distribution of fed controls. These data do not indicate whether the effect of insulin was due to an absolute increase in ribosomal material or to a conversion of mono- and disomes to polysomes. Insulin treatment of fasted or fasted and fat-refed animals did not cause a restoration of polysomes. It appears that the effects of acute fasting and refeeding on polysomes are not attributable to a direct action of amino acids.

1123 **DNA REPLICATION AND DEGRADATION IN MAMMALIAN TISSUE. I. CHANGES IN DNA POLYMERASE AND NUCLEASE DURING RAT LIVER REGENERATION.** *(E.)* Ove, P. (Duke U. Med. Ctr., Durham, N. C.), M. D. Jenkins and J. Laszlo. *Biochim Biophys Acta* 174(2):629-635, 1969.

The *in vivo* incorporation of (^3H)-thymidine (20 μC i.p.) into rat liver DNA was compared with the *in vitro* activities of DNA polymerase and deoxyribonuclease in regenerating rat liver at various times after partial hepatectomy. Deoxyribonuclease activity (using denatured DNA as substrate) fluctuated inversely with DNA synthesis, whereas DNA polymerase activity (using native DNA as primer) started to increase when (^3H)-thymidine incorporation *in vivo* increased and remained elevated for 60 hr following the operation, despite cyclic depression of (^3H)-thymidine incorporation. Nuclease activity fluctuated with the waves of DNA synthesis. Results of another experiment showed similar patterns of enzyme activity but the times of maximum (^3H)-thymidine incorporation were different from the previous experiment. The reason for the difference in time of cell cycles in these 2 sets of experiments is not known, but may be related to uncontrolled physiological parameters. Rat liver polymerase demonstrated a preference for native DNA primer, while deoxyribonuclease in the same preparation acted preferentially on denatured DNA. The preference shown by polymerase may be due to the associated deoxyribonuclease activity in the pH 5.0 protein fraction used. It is suggested that deoxyribonuclease plays an important role in the control of DNA synthesis.

1124 **THE ROLE OF SULFHYDRYL GROUPS IN OXIDATIVE PHOSPHORYLATION AND ION TRANSPORT BY RAT LIVER MITOCHONDRIA.** *(E.)* Haugaard, N. (U. Pennsylvania Sch. Med., Philadelphia), N. H. Lee, R. Kostrzewa, R. S. Horn and E. S. Haugaard. *Biochim Biophys Acta* 172(2):198-204, 1969.

The sulfhydryl reagent DTNB [5,5'-dithio-bis-(2-nitrobenzoic acid)] (0.04 mM) prevented the respiratory response of rat liver mitochondria to ADP and inorganic phosphate when either glutamate or succinate was added as substrate, but did not greatly influence oxygen uptake in the absence of phosphate acceptor or when stimulated by 2,4-dinitrophenol. The stimulation of respiration produced by addition of calcium ions was inhibited by this concentration of DTNB, while the additional increase in respiration produced by both $CaCl_2$ and phosphate was completely abolished. In the presence of glutamate, the formation of ATP from ADP and phosphate progressively decreased as the concentration of DTNB increased (maximal effect at 0.020 mM). The stimulatory effect of inorganic phosphate on calcium uptake by mitochondria was completely prevented by DTNB, and calcium uptake in the presence of glutamate and ATP was partially inhibited. DTNB also inhibited completely the extrusion of calcium by calcium-loaded mitochondria incubated in the presence of inorganic phosphate and a low concentration of magnesium. Phosphate-induced extrusion of calcium by mitochondria allowed to take up calcium in the presence of ATP and glutamate was prevented by DTNB added 1 min before the phosphate; mitochondrial swelling also was inhibited. These studies indicate that a reactive site involving a sulfhydryl group is involved either in the entrance of inorganic phosphate into the mitochondrion or in the formation of an intermediate essential for oxidative phosphorylation and ion transport.

1125 **THE EFFECTS OF BILE SALTS AND THYROID HORMONE ON CHOLESTEROL ESTERASE AND ESTERIFYING ENZYME IN RAT LIVER.** *(E.)* Sakamoto, A. (Tottori U. Sch. Med., Yonago, Japan). *Yonago Acta Med* 12(2): 81-91, 1968.

The effects of bile salts and thyroid hormone on the activity of both cholesterol esterase and esterifying enzyme in subcellular fractions of rat liver homogenates were studied using radioactive substrates. Bile salts stimulated cholesterol esterase activity at concentrations below 5.8×10^{-4}M, and decreased activity at higher concentrations. Esterifying enzyme was inhibited by bile salts at all concentrations. Hyperthyroidism caused a marked inhibition of esterifying enzyme activity in microsomes and mitochondria, whereas hypothyroidism caused some increase in this activity. Hyper- and hypothyroidism had no effect on the esterase activity of the soluble cell fraction, and increased this activity somewhat in microsomes and mitochondria. It is suggested that hyperthyroidism shifts the equilibrium between cholesterol and cholesterol esters toward the free form, particularly in the microsomes.

1126 **THE DYNAMICS OF BILIARY ELECTROLYTE EXCRETION (SODIUM, POTASSIUM, AND CALCIUM) AND THE CHARACTERISTICS OF THE AFTER-EFFECTS FOLLOWING SINGLE AND REPEATED DOSES OF UZHGOROD MINERAL WATER.** *(Rus.)* Gmitrova, A. D. (Uzhgorod U., USSR). *Vop Kurort Fizioter* 33(6):516-521, 1968.

The effects of Uzhgorod mineral water (which contains 1.9 g of minerals, 44 mg Fe and 2.0 g CO_2 per liter) on biliary secretion and the electrolyte composition of the bile were studied in 15 dogs with gallbladder fistulas. The mineral water was given p.o. in 200-ml doses, either once or twice a day for 5 days, 2-3 times a day for 7 days, or 3 times a day for 1 month, and biliary secretion was studied for up to 1 month after the last dose. A single daily dose of mineral water increased the volume of biliary secretion by an average of 29.4% and increased the total output of sodium, potassium and calcium by 31.2%, 40.4% and 62%, resp., even though the electrolyte concentration showed little change. Comparable figures after short-term administration of 2 or 3 daily doses were 7.5, 13.9, 24.3 and 16% and 53.2, 55.2, 73.2 and 18.1%, resp., accompanied by an increase in the K/Ca coefficient. When mineral water was given 3 times a day for 1 month, bile secretion rose by an average of 36.1%, the output of sodium, potassium and calcium increased by 30.4%, 19.7% and 100.1%, resp., the K/Ca coefficient decreased (as did the sodium and potassium concentrations), and the calcium concentration in the bile rose. These effects persisted for at least 10 days beyond the end of treatment. After each dose of mineral water, bile secretion initially decreased for 1 hr and then increased above normal values during the 3rd-5th hr. Sodium excretion showed a closer correlation than potassium or calcium excretion with the total volume of biliary secretion. These effects are tentatively ascribed to the interaction of the serum electrolytes with the stimulatory and inhibitory effects of the autonomic nervous system on biliary secretion.

1127 **THE EFFECT OF ORAL PHENOBARBITONE ON HEPATIC MICROSOMAL CYTOCHROME P-450 AND DEMETHYLATION ACTIVITY IN RATS FED NORMAL AND LOW PROTEIN DIETS.** *(E.)* Marshall, W. J. (U. Coll. Hosp. Med. Sch., London, England) and A. E. M. McLean. *Biochem Pharmacol* 18(1):153-157, 1969.

Oral administration of phenobarbitone (1 mg/ml solution to drink instead of water) to male Carworth rats produced marked increases in cytochrome P-450, hepatic microsomal protein and liver weight comparable to those resulting from i.p. injection of the drug. The stimulation achieved by this oral dose (approximately 100 mg/kg/day) was maximal. The oral route of administration offers a convenient technique for long-term studies involving phenobarbitone administration. Increasing the concentration of phenobarbitone solutions from 0.01 to 2 mg/ml increased the liver weight, microsomal protein, cytochrome P-450 and pyramidon demethylation up to a maximum at 1 mg/ml. Stimulation of these parameters was maximal after 7 days, remaining constant for the remaining 7 days of observation. Withdrawal of the drug caused an abrupt decrease in the elevated levels and control values were reached within 7 days. Feeding a 3% casein diet for 14 days reduced cytochrome P-450 to 33% of control values. Administration of phenobarbitone (1 mg/ml solution to drink) to rats on this low-protein diet increased P-450 to only 25% of the level attained in phenobarbitone-treated animals on a stock diet.

1128 **THE FUNCTIONAL SIGNIFICANCE OF CHANGES IN ACTIVITY OF THE ENZYMES, TRYPTOPHAN PYRROLASE AND TYROSINE TRANSAMINASE, AFTER INDUCTION IN INTACT RATS AND IN THE ISOLATED, PERFUSED RAT LIVER.** *(E.)* Kim, J. H. (Sch. Med. Dent., U. Rochester, N. Y.) and L. L. Miller. *J Biol Chem* 244(6): 1410-1416, 1969.

Using the rate of $^{14}CO_2$ evolution from the oxidation of tryptophan-3-^{14}C or tyrosine-1-^{14}C as an index of the *in vivo* functional activity of tryptophan pyrrolase (TP) or tyrosine transaminase (TT), resp., the quantitative functional changes associated with changes in the activity of these hepatic enzymes as measured *in vitro* after hormonal or substrate induction were studied in intact normal and adrenalectomized adult male Sprague-Dawley rats. Also, the clearance of tryptophan from and the appearance of kynurenine in the circulating perfusate was measured in isolated perfused rat liver preparations. Significant increases in enzyme activity induced by treatment with hydrocortisone or substrate load, or both, in intact or adrenalectomized animals and in the perfused liver were not associated with parallel increases in oxidation of the labeled amino acids to $^{14}CO_2$; however, increasing the substrate load *per se* was associated with large quantitative increases in production of $^{14}CO_2$ under conditions in which the activity of the enzymes was not altered. In intact rats, pretreatment with hydrocortisone or a tryptophan load induced 3-4 fold increases in TP activity, while the conversion of ^{14}C-tryptophan to $^{14}CO_2$ increased by at most 20%. Yet, under conditions which produced no significant increase in TP activity (increasing substrate load from 17.5 to 35 mg), there was a significant increase in the percentage of the dose oxidized to $^{14}CO_2$. In adrenalectomized animals, TP activity rose 6-fold under hormone induction, but the oxidation of a tracer dose of labeled tryptophan to $^{14}CO_2$ remained unchanged. The proportion of administered tyrosine-1-^{14}C converted to $^{14}CO_2$ increased significantly with a 10 or 30 mg load of substrate, yet TT activity was unaltered.

In contrast, pretreatment with hydrocortisone produced a 7-14 fold increase in enzyme activity without substantially changing the rate of conversion to $^{14}CO_2$. In the perfused liver, despite significant increases in TP activity associated with the action of a tryptophan load or hydrocortisone, the relative conversion to $^{14}CO_2$ was not affected. Hormonal induction of TP did not enhance the accumulation of kynurenine in or alter the rate of clearance of graded loads of tryptophan from the perfusate.

1129 EFFECT OF SECRETIN AND ACETAZOLAMIDE ON THE VOLUME AND ELECTROLYTE COMPOSITION OF HEPATIC BILE IN MAN. *(E.)* Waitman, A. M. (Mount Sinai Sch. Med., New York, N. Y.), W. P. Dyck and H. D. Janowitz. *Gastroenterology* 56(2):286-294, 1969.

The rate of flow and electrolyte concentrations of hepatic bile were determined in 10 cholecystectomized patients with T-tubes in the common duct both in the basal state and after secretin (1 U/kg i.v.) stimulation. Basal electrolyte composition of the bile closely resembled plasma concentrations, and the rate of flow averaged 3.6 ± 0.17 ml/10 min. During the 1st 30 min after secretin stimulation, there was an average increase of 119% in the flow rate, 283% in bicarbonate output, 115% in sodium output, 104% in potassium output, 100% in chloride output and 16% in taurocholate output. The effects of secretin had completely disappeared in 30 min. After acetazolamide alone (25 mg/kg), an average reduction of 17% in the rate of flow, 18% in potassium output and 20% in taurocholate output was noted; bicarbonate, chloride, and sodium concentrations did not differ significantly from basal values. When acetazolamide was given 10 min after secretin injection, all of the volume and output responses were diminished: volume by 19%, bicarbonate by 37%, chloride by 9%, sodium by 18%, and potassium by 40%. It is concluded that secretin augments the flow of common duct bile in man with the addition of bicarbonate-containing fluid by a process which is catalyzed in part by carbonic anhydrase.

1130 HUMAN HEPATIC URIDINE DIPHOSPHATE GALACTOSE PYROPHOSPHORYLASE: ITS CHARACTERIZATION AND ACTIVITY DURING DEVELOPMENT. *(E.)* Abraham, H. D. (Johns Hopkins U. Sch. Med., Baltimore, Md.) and R. R. Howell. *J Biol Chem* 244(3):545-550, 1969.

The uridine diphosphate (UDP)-galactose pyrophosphorylase activity of human liver was studied at various ages, using a new assay method which utilizes uniformly-labeled ^{14}C-galactose-1-P and rapid chromatographic separation of the ^{14}C-UDP-galactose formed on diethylaminoethyl cellulose paper. Enzyme activity was enhanced 2-fold by the sulfhydryl reagent, dithioerythritol. Magnesium was shown to be an absolute requirement for enzyme activity; however, the enzyme was inhibited by high magnesium concentrations. Michaelis constants were 0.8 x 10^{-3} M for uridine triphosphate (UTP) and 1.8 x 10^{-3} M for galactose-1-P. Inhibition of enzyme activity was observed at high levels of UTP; this inhibition was reversible by increasing the concentration of galactose-1-P. In contrast to earlier findings on the rat hepatic enzyme, the enzyme activity in human liver changes little from the newborn period to old age. The ability of this enzyme to metabolize galactose-1-P in human liver is probably not more than 1.0% of the activity of galactose-1-P uridyl-transferase.

1131 CONTROL OF RAT LIVER AROMATIC AMINO ACID TRANSAMINASES BY GLUCAGON AND INSULIN. *(E.)* Brown, C. B. (VA Hosp., Long Beach, Calif.) and M. Civen. *Endocrinology* 84(2):381-385, 1969.

Experiments were performed on male Sprague-Dawley rats to elucidate the role of insulin and glucagon in the induction and repression of tyrosine α-ketoglutarate transaminase (TKT) activity and phenylalanine pyruvate transaminase (PPT) activity. Either glucagon or insulin, administered at pharmacological levels, increased TKT activity, but only glucagon increased PPT activity. Anti-insulin serum (AIS), which produced an acute diabetic condition when administered in large doses, elevated TKT but depressed PPT activity. Glucagon further enhanced TKT and reversed the PPT repression when given to AIS treated rats. These results suggest that glucagon and insulin, under physiological conditions, may have mutually opposing actions in the regulation of these 2 liver transaminases.

1132 AMINE SYNTHESIS IN REGENERATING RAT LIVER: EFFECT OF HYPOPHYSECTOMY AND GROWTH HORMONE ON ORNITHINE DECARBOXYLASE. *(E.)* Russell, D. H. (Johns Hopkins U. Sch. Med., Baltimore, Md.) and S. H. Snyder. *Endocrinology* 84(2):223-228, 1969.

The effect of hypophysectomy and subsequent hormone therapy on ornithine decarboxlyase (ORD) activity was examined in regenerating rat liver. Enzyme activity was determined by measuring the liberation of $^{14}CO_2$ from carboxyl-labeled ornithine. In rats with intact pituitaries, ORD activity 4 hr after hepatectomy was 10 times that of sham-operated controls. Hypophysectomized rats failed to show an increase in ORD activity 4 hr after hepatectomy. A time-course study showed that hypophysectomy resulted in a delayed increase and an early decline of ORD activity after parital hepatectomy. After the removal of thyroids, adrenals, ovaries or testes, the increase in ORD activity 4 hr after hepatectomy was the same as in control animals. Treating hypophysectomized animals with triiodothyronine prior to hepatectomy produced a small but significant increase in enzyme activity. Growth hormone treatment produced a greater enhancement, although enzyme levels were still lower than those of control rats. Combined treatment of hypophysectomized rats with growth hormone and triiodothyronine restored ORD activity 4 hr after hepatectomy to levels of control animals. Growth hormone administration to normal rats for 3 days produced a 3-fold increase in liver ORD activity. These findings indicate that ORD activity is closely related to rapid tissue growth.

1133 CHANGES IN THE CONTENT OF SOME AMINO ACIDS IN THE LIVER OF WHITE RATS AFTER ADMINISTRATION OF NICOTINAMIDE. *(Uk.)* Shmat'ko, T. M. (Inst. Biochem., Ukrainian Acad. Sci., Kiev, USSR). *Ukr Biokhim Zh* 40(6):568-571, 1968.

White rats were given 500 mg/kg nicotinamide or 250 mg/kg of glycocyamine i.p. Animals were decapitated and deproteinized liver extracts were prepared 6 hr after injection of nicotinamide and 2 hr after injection of glycocyamine. Determinations of free amino acids by paper chromatography after administration of nicotinamide showed that the lysine content had increased by 80%, the threonine content by 200%, the valine content by 145%, and the leucine content by 73%. Administration of glycocyamine produced increases in free lysine, threonine, and valine but not in leucine or isoleucine. When ^{35}S-labeled methionine was injected after glycocyamine, the radioactivity of the deproteinized liver extract was higher than in controls and ^{35}S radioactivity was redistributed. Since nicotinamide produced increases in the activity of neutral, but not acid, proteases, increases in free amino acids in the liver are probably due to increased proteolysis of liver proteins. Cysteine, the content of which is increased by glycocyamine, is an activator of many proteolytic enzymes and may help to produce increases in the content of other free amino acids.

1134 ACTIVATION OF HYDROCORTISONE-INDUCED TRYPTOPHAN PYRROLASE OF RAT LIVER BY SKF 525-A: THE POSSIBLE INVOLVEMENT OF ANTIDIURETIC HORMONE. *(E.)* Magus, R. D. (Coll. Med., U. Iowa, Iowa City), D. E. Rickert and J. R. Fouts. *Biochem Pharmacol* 17(10):2071-2080, 1968.

The nature and mechanism of the pituitary-dependent potentiation by SKF 525-A of hydrocortisone induction of hepatic tryptophan pyrrolase was studied in the rat. SKF 525-A was found to produce modest increases in plasma corticosterone (supporting previous evidence that the drug evokes ACTH release). ACTH administration to hydrocortisone-treated rats, however, did not potentiate the action of hydrocortisone on tryptophan pyrrolase. Growth hormone was also inactive in this respect. Epinephrine, glucagon, and both exogenous and endogenous (released by nicotine) antidiuretic hormone were capable of potentiating hydrocortisone induction of tryptophan pyrrolase. Potentiation of hydrocortisone action by SKF 525-A, epinephrine, or nicotine was not detectable if enzyme preparations were assayed with excess hematin added *in vitro*, indicating that potentiation occurs via an activation process as opposed to enzyme induction. The mechanism of this activation process remains to be elucidated.

1135 INCORPORATION OF RADIOACTIVE BICARBONATE INTO LIVER AND MUSCLE PROTEINS AND LIPIDS AND INTO PERINEPHRIC ADIPOSE TISSUE OF YOUNG AND ADULT RABBITS. *(Uk.)* Gulyi, M. F. (Inst. Biochem., Ukrainian Acad. Sci., Kiev, USSR), G. I. Zhurbin and G. Ia. Korniiaka. *Ukr Biokhim Zh* 40(6):616-619, 1968.

The incorporation of bicarbonate into liver proteins and lipids was studied in young and adult rabbits 30-36 min after they were given 0.135 μC/g of NaH^{14}CO$_3$ i.v. The rate of bicarbonate incorporation was faster and the specific radioactivity of proteins and lipids was greater in adult animals. After 90 min the rate of protein turnover in adults was 38% higher and the rate of lipid turnover 72% higher than in young animals. In both groups protein and lipid radioactivity was a function of time. The specific radioactivity of these substances reached a maximum 1.5 hr after injection and then gradually decreased. The radioactivity of lipids declined much more slowly than that of proteins.

1136 THE EFFECTS OF CERTAIN GONADAL HORMONES ON THE CONTENT AND COMPOSTION OF LIPIDS IN THE BLOOD AND LIVER OF IMMATURE MALE CHICKS. *(E.)* Balnave, D. (Dept. Agric. Chem., Queen's U., Belfast, Northern Ireland). *Comp Biochem Physiol* 28(2): 709-716, 1969.

Changes in the lipid composition of the blood and liver in response to the gonadal hormones, estrogen, androgen, and progesterone were investigated in the male chick *(Gallus domesticus)*. In the 1st of 2 experiments, 934 chicks, maintained on a standard diet for 6 weeks, were divided into 4 treatment groups: 1) 0.5 ml alcohol; 2) 10 mg estradiol dipropionate in 0.5 ml alcohol; 3) 5 mg testosterone in 0.5 ml alcohol; and 4) 5 mg progesterone in 0.5 ml alcohol. These treatments were given as a series of 5 i.m. injections over a 10-day period; animals were sacrificed on the 10th day. In the 2nd experiment, 606 chicks were divided into 4 treatment groups, with treatments administered as in the 1st experiment: 1) 0.5 ml alcohol; 2) 10 mg estradiol dipropionate in 0.5 ml alcohol; 3) 5 mg testosterone in 0.5 ml alcohol; and 4) 10 mg estradiol + 5 mg testosterone in 0.5 ml alcohol. The liver weight gains of the estrogen-treated birds in the 1st experiment were significantly reduced compared to controls. Neither the testesterone nor the progesterone treatment in the 1st experiment nor any of the hormone treatments in the 2nd experiment had any significant effect on liver weight gain. Estrogen treatment in both experiments significantly increased the liver dry matter content, while estrogen plus androgen enhanced this effect. The total liver lipid content in both experiments was significantly increased by estrogen treatment; testosterone and progesterone had no effect on liver lipid content. In the 1st experiment, the total blood lipid content of the estrogen-treated birds was significantly increased, while the testosterone and progesterone treatments significantly decreased blood lipid content. These results indicate that, although progesterone appears to have no long-term influence on the lipemic response of avian liver, both androgen and estrogen can exert significant effects on lipid metabolism and fatty acid composition.

1137 RATES OF INCORPORATION OF TRITIUM-LABELED THYMIDINE INTO THE MITOCHONDRIAL AND NUCLEAR DNA OF NORMAL RAT LIVER, REGENERATING LIVER, AND FOUR HEPATOMAS WITH DIFFERENT GROWTH RATES AND THEIR HOST LIVERS. *(E.)* Chang, L. O. (U. Virginia Sch. Med., Charlottesville), H. P. Morris and W. B. Looney. *Brit J Cancer* 22(4):860-866, 1968.

Tracer studies revealed a pronounced difference in the rate of incorporation into mitochondrial (mtDNA) and nuclear (nDNA) fractions of host liver cells between rats with rapidly growing hepatomas (3924A, H-35 tc$_2$, H-35) and those with hepatomas of intermediate growth rate (9121). In the former, the rate of incorporation into mtDNA of the host liver was about 1/3 the rate of incorporation into nDNA; in the latter, the rate of incorporation into mtDNA of the host liver was 29-77 times as great as the rate of incorporation into nDNA. Moreover, the rate of incorporation into mtDNA of host livers with rapidly growing tumors was 1/10 the rate of incorporation into mtDNA of host livers with tumor 9121. The mitochondrial to nuclear DNA specific activity ratios for regenerating liver were less than 1 and similar to the ratio of rapidly growing tumors; the ratio for tumor 9121 varied from 1.2 to 4.5. Regenerating liver showed a 48-fold increase in nDNA synthesis, but only a 2.5-fold increase in mtDNA synthesis. The tumor/host mtDNA activity of undifferentiated tumors was 8-12 times as great as the ratio for well-differentiated tumors, but there was no correlation in nDNA activity. Explanations for these results are offered based on competition between tumor and host cells and between sub-cellular fractions.

1138 *IN VIVO* AND *IN VITRO* STUDIES OF THE REGULATION OF PALMITYL-CoA SYNTHETASE ACTIVITY IN RAT LIVER. *(E.)* Farstad, M. (Inst. Clin., Biochem., U. Oslo, Norway). *Acta Physiol Scand* 74(4):568-576, 1968.

A procedure is described for evaluating the palmityl-CoA synthetase activating capacity of particle-free supernatant from various sources. Using small smounts of rat liver tissue (less than 6 mg), the activation of particulate palmityl-CoA synthetase was found to be proportional to the amount of supernatant present, regardless of whether microsomes and supernatant from the same or different animals were used. The enzyme activity of whole liver homogenates was significantly reduced after feeding sucrose for 36 hr and increased after fasting for 8 or 24 hr. The activity of the activating factor or particle-free supernatant also increased significantly after fasting. When incubated in the presence of 5mM $MgCl_2$, microsomal palmityl-CoA synthetase was rapidly inactivated; 2mM EDTA markedly reduced the inactivation. ATP (5 mM) prevented inactivation of palmityl-CoA synthetase *in vitro,* but NaCl and NaF reduced the enzyme inactivation. At all concentrations tested ($2 \times 10^{-3} - 10^{-1}$M) NaF was more effective than NaCl. $CaCl_2$ (5 mM), but not KCl (50 mM) also reduced the inactivation *in vitro.* Partially inactivated palmityl-CoA synthetase was partially reactivated by incubation with particle-free supernatant in the presence of ATP. Cyclic AMP (10^{-4} M) did not increase the supernatant activation. These findings suggest that the stimulating effect of supernatant on the particle-bound palmityl-CoA is due to an enzymatic transformation of an inactive or less active synthetase into a more active form, and that the inactivation of the synthetase may involve a phosphoprotein phosphatase.

1139 A POSSIBLE ROLE FOR RIBONUCLEASE IN THE REGULATION OF PROTEIN SYNTHESIS IN NORMAL AND HYPOPHYSECTOMIZED RATS. *(E.)* Brewer, E. N. (St. Jude Children's Res. Hosp., Memphis, Tenn.), L. B. Foster and B. H. Sells. *J Biol Chem* 244(6):1389-1392, 1969.

The total ("active" + "latent") alkaline ribonuclease (RNase) content of postmitochondrial supernatant fractions derived from hypophysectomized rat liver was found to be twice that in corresponding preparations from normal rat liver. Intraperitoneal administration of bovine growth hormone to fasted hypophysectomized animals produced a significant decrease in the elevated RNase levels within 12 hr. Most polysome preparations from intact normal, hypophysectomized and growth hormone-treated hypophysectomized animals showed a similar size class distribution and *in vitro* amino-acid-incorporating capacity. Occasionally, however, polysome preparations from hypophysectomized rats exhibited a decreased capacity for cell-free protein synthesis which was related to the degree of shift to lower polysome size classes. Preparations with as little as 20% of normal activity were observed. When the optical density profile revealed polysome breakdown, significant "active" RNase activity was detected in the corresponding postmitochondrial supernatant fraction. These data suggest that the ribosomes present in polysome preparations from hypophysectomized rat liver are functionally equivalent to ribosomes from normal animals. The apparent translational defect of polysomes from livers of hypophysectomized rats, as reported by others, may be a result of polysome breakdown during isolation and incubation due to the elevated RNase activity of the postmitochondrial supernatant fractions from which the polysome preparations are derived.

1140 STUDIES ON THE METABOLIC N-DEMETHYLATION. VI. EFFECT OF MORPHINE AND NALORPHINE ON THE OXIDATIVE DEMETHYLATION *IN VITRO* IN THE LIVER FROM INTACT AND ADRENALECTOMIZED RATS. *(E.)* Minegishi, K. (Tohoku U. Sch. Med., Japan), Y. Kuroiwa and S. Okui. *Chem Pharm Bull* 16(9): 1649-1654, 1968.

In experiments on intact and adrenalectomized rats of both sexes, nalorphine was found to inhibit N-demethylation of morphine (as well as meperidine) in liver microsomal preparations from either intact or adrenalectomized rats, but the inhibitory effect of morphine was antagonized by the administration of nalorphine. The degree of antagonism was related to both the dose and the order of administration; 20-100 mg/kg significantly reversed the depression of enzymatic activity produced by 100 mg/kg morphine injected at the same time. However, even a high dose (200 mg/kg) of nalorphine did not reverse the inhibition of liver enzyme activity in rats pretreated with morphine. It is concluded that the effects of morphine and nalorphine are not mediated by adrenal hormones, and since the antagonism cannot be demonstrated once morphinization is in progress, nalorphine must be a pharmacological rather than a chemical antagonist.

1141 EFFECTS OF THYROID AND ADRENAL HORMONES ON CELL POTENTIALS AND IONIC CONCENTRATIONS IN THE RAT LIVER. *(Fr.)* Claret, M. (Lab. Comp. Physiol., Fac. Sci., Orsay, France) and E. Coraboeuf. *C R Soc Biol (Paris)* 162(5/6):1100-1104, 1968.

In experiments performed on Wistar rats, thyroidectomy produced a marked increase in liver cell potentials 2-3 weeks after surgery. This increase is due mainly to a decrease in extracellular (plasma) Na^+ and, to a lesser extent, to increased permeability of liver cells for K^+ and a decrease in extracellular space. Intracellular (liver) Na^+ increased, both in thyroidectomized rats and intact rats receiving 160 μg/kg/day of thyroxine, but liver cell potentials decreased slightly in hyperthyroid animals. Marked depolarization occurred in adrenalectomized animals which were not given NaCl in their drinking water for 2 days before the experiment, while cell potentials were almost normal in adrenalectomized animals which continued to receive NaCl. These findings suggest that liver cell potentials might depend on H_+ or Cl^- ions rather than K^+ ions or on other factors not taken into account in these experiments.

1142 LIVER REGENERATION AFTER PARTIAL HEPATECTOMY IN BIOTIN-DEFICIENT RATS. II. THE PYRIDINE NUCLEOTIDES AND SPECIFIC NUCLEOTIDASE ACTIVITY IN THE LIVER AND ERYTHROCYTES. *(Fr.)* Ababei, L. (Inst. Med. Res., Jassy, Romania), M. Filip and G. Leporda. *Rev Int Hepat* 18(8):1023-1031, 1968.

Diphosphopyridine nucleotide (NAD), NADP, NADase and NADPase levels were determined in the liver and whole blood of intact, normal hepatectomized, biotin-deficient, and biotin-deficient hepatectomized young male white rats. Partial hepatectomies were performed by the procedure of Higgins and Andersen, and biotin deficiency was induced by the method of

Terroine and Rombauts. Determinations on hepatectomized animals were made during liver regeneration, 48 hr after surgery. Significant increases occurred in the content of NAD in the liver of hepatectomized rats during regeneration and, to a lesser extent, in the liver of biotin-deficient hepatectomized animals. Liver NADP increased in hepatectomized rats and decreased in biotin-deficient hepatectomized rats. Increases in blood NAD concentrations occurred in both hepatectomized and biotin-deficient hepatectomized rats. Blood NADP concentrations increased in hepatectomized rats and decreased in biotin-deficient hepatectomized rats. During regeneration, liver and blood NADase and NADPase activities decreased in both hepatectomized and biotin-deficient hepatectomized animals. In normal hepatectomized animals the decrease in NADase and NADPase activity accounted only partially for increases in NAD and NADP. In biotin-deficient animals there was almost ideal agreement between the decrease in NADase activity and the content of NAD in the liver and blood.

1143 THE EFFECT OF A DERIVATIVE OF DIPHENOXYACETIC ACID ON BILIARY AND PANCREATIC SECRETION IN THE RAT. *(Fr.)* Debray, C. (Bichat Hosp., Paris, France), C. Vaille, J. de la Tour, C. Roze, M. Souchard and J. Chariot. *Rev Int Hepat* 18(6):785-798, 1968.

Male Wistar rats under ethylurethan anesthesia were given 0.20 mg/kg of (diphenoxy)acetylaminopropylmorpholine i.m. Results were compared with those obtained on controls by analysis of variance. During the 3 hr observation period a slight increase occurred in the flow of pancreatic juice. Decreases were observed in the total protein concentration and total protein output in pancreatic juice and, to a lesser extent, in amylase concentration and output. Bile flow was increased 45% during the 1st hr and 12% in the 2nd. This effect was slightly greater and more prolonged than that produced by the same dose of sodium dehydrocholate. During the 1st hr the bilirubin concentration decreased slightly and the water output increased markedly, resulting in an increase in bilirubin secretion. The drug had no effect on the respiratory parameters studied.

1144 THE REGULATION OF PROTEIN SYNTHESIS IN THE LIVER OF RATS: MECHANISMS OF DIETARY AMINO ACID CONTROL IN THE IMMATURE ANIMAL. *(E.)* Wannemacher, R. W. Jr. (Bur. Biol. Res., Rutgers State U., New Brunswick, N. J.), W. K. Cooper and M. B. Yatvin. *Biochem J* 107(5):615-623, 1968.

Weanling (23-day-old) rats were fed either an amino acid-deficient diet (6% casein) or a diet containing an adequate amount of protein (18% casein) for 28 days so that the ribosomal concentration and distribution in hepatocellular populations from rats on both dietary regimens could be compared with their protein-biosynthetic ability. The hepatic cells from the animals fed on the low-protein diet were characterized by a low amino acid content, almost complete inhibition of cell proliferation and a marked decrease in cell volume, protein content and concentration of cytoplasmic RNA compared with cells from control rats. The lower concentration of cytoplasmic RNA was correlated with a decreased ribosomal-RNA content, of which a larger proportion was in the form of free ribosomes. The protein-synthetic competence and messenger-RNA content of isolated ribosomes from liver cells of protein-deprived animals were 40-50% of those noted in controls. At 1 hr after an injection of radioactive uridine, the specific radioactivity of liver total RNA was greater in the group fed on the low protein diet, but the amount of label that was associated with cytoplasmic RNA or ribosomes was significantly less than that noted in control animals. From these data it is concluded that dietary amino acids regulate hepatic protein synthesis by affecting the ability of polyribosomes to synthesize protein and by influencing the concentration of cytoplasmic ribosomes.

1145 FACTORS INFLUENCING THE DEVELOPMENT OF UREA-SYNTHESIZING ENZYMES IN RAT LIVER. *(E.)* Räihä, N. C. R. (Dept. Med. Chem., U. Helsinki, Finland) and J. Suihkonen. *Biochem J* 107(6):793-797, 1968.

The developmental pattern of carbamoyl phosphate synthetase, ornithine transcarbamoylase, argininosuccinate synthetase, argininosuccinase and arginase, which are all involved in urea synthesis was studied in the livers of Sprague-Dawley rat fetuses of various ages. In 21-day-old fetal liver, only ornithine transcarbamoylase and arginase had activities exceeding 20% of adult activity. At birth, arginine synthetase exhibited the lowest relative activity of all enzymes, but its postnatal increase was the most rapid and the activity increased 5-fold within 24 hr after birth. Carbamoyl phosphate synthetase activity increased 3-fold during the first day, while the other 3 enzymes showed a 2-fold or less increase in activity. Starvation of newborn rats for 24 hr had very little effect on the postnatal increase of any of the enzymes studied. When puromycin was given to newborn rats there was a marked inhibitory effect on the postnatal increase in arginine synthetase. Puromycin (0.25 mg i.p.) inhibited protein synthesis totally in the liver when given every hr, but when given every 3 hr only a 70-80% inhibition was expected. Adrenalectomy caused an almost complete inhibition of the postnatal increase in liver arginine synthetase at 24 hr after birth. The inhibition was 72% when adrenalectomy was performed 48 hr after birth. Treatment of the unoperated newborn with triamcinolone (0.5 mg/day) resulted in a marked stimulation of the postnatal increase in arginine synthetase activity.

1146 THE INFLUENCE OF SOME PHYSICO-CHEMICAL FACTORS ON THE BILIARY EXCRETION OF A SERIES OF STRUCTURALLY RELATED ARYL SULPHATE ESTERS. *(E.)* Hearse, D. J. (Dept. Biochem., U. Coll., Cardiff, Wales), G. M. Powell, A. H. Olavesen and K. S. Dodgson. *Biochem Pharmacol* 18(1):181-195, 1969.

The metabolism and mode of excretion of biphenylyl 4-^{35}S-sulfate (BS), cyclohexylphenyl-4-^{35}S-sulfate (C4S) and cyclohexylphenyl-2-^{35}S-sulfate (C2S) were studied in MRC hooded rats. In experiments with free-ranging rats given i.p. injections of the ^{35}S-labeled esters (100 mg/100 g), 76-98% of the radioactivity was recovered in the urine, but the proportion of radioactivity appearing as inorganic ^{35}S-sulfate varied with each ester (BS, 36% in the male and 19% in the female; C4S, 33% in the male and 19% in the female; C2S, less than 2% in either sex). Following i.v. administration of 100 mg/100 g of BS, C2S and C4S to rats with bile duct fistulas, up to 18%, 70% and 81% of the radioactivity appeared in the bile, resp. In all studies there was rapid urinary and biliary elimination of the 3 esters. Thin-layer chromatography, autoradiographic and β-glucuronidase studies revealed that for each ester only 1 major radioactive component was present in the bile and this was identified as a glucuronic acid conjugate. The latter may undergo degradation in the gastrointestinal tract, resulting in loss of the glucuronic acid residue, reabsorption and subsequent urinary excretion of the aglycone. In liver perfusion studies it was shown that appreciable desulfation of B4S occurred under "closed system" conditions, but there was no significant increase in the level of biliary elimination compared with the results from cannulated rats. The degree of binding to plasma proteins (BS, 90%; C2S, 95%; C4S, 70%) was not related to the amount of biliary excretion of the ester. These results are discussed in relation to the physicochemical characteristics of the esters and it is concluded that the balance of lipophilic and hydrophilic properties is not the prevailing factor in determining the route of elimination.

1147 **THE EFFECT OF ESTROGEN ON BILE FORMATION IN THE RAT.** *(E.)* Forker, E. L. (Dept. Physiol. Biophys., U. Iowa, Iowa City). *J Clin Invest* 48(4): 654-663, 1969.

In 18-hr fasted virgin-female Sprague-Dawley rats, daily s.c. administration of 2.5 mg estrone for 7 days resulted in significantly diminished bile flow (7.8 µl/min compared with 11.6 in controls) and a reduced choleretic response to 0.6 mg/min dehydrocholate (18.1 µl/min compared to 26.6 in controls). During spontaneous bile flow, clearance of sucrose-^{14}C (4 µC) 2.5-3 hr after i.v. injection was at least twice as fast in rats treated with estrone as in controls. Mannitol-^{3}H clearance (20 µC i.v.) during spontaneous bile flow was almost identical to bile flow in both estrone-treated and control rats, but during choleresis, mannitol clearance was about 20% less than bile flow in the control group, while the bile:plasma concentration ratio remained close to 1 in animals given the hormone. These studies indicate that estrone increased the permeability of the biliary tree to sucrose and mannitol. Estrone also reduced the steady-state clearance of BSP given by continuous infusion (0.1 mg/min) from 5.1 ± 1.3 in controls to 2.6 ± 0.6 ml/min. This decline in clearance was associated with mean decrements of 20% in bile flow and 30% in the bile:plasma concentration ratio. Studies with BSP given by single i.v. injection (60 mg/kg) to saturate excretory transport also demonstrated reduced BSP clearance. These observations support the hypothesis that estrogen cholestasis may involve enhanced diffusion of materials from bile to blood in addition to inhibition of active transport in the opposite direction. Light microscopic examination of livers from rats treated with estrone revealed slightly larger liver cell nuclei compared with control livers, but no signs of necrosis, inflammation, fatty metamorphosis or cholestasis.

1148 **THE EFFECT OF PHENOBARBITONE TREATMENT OF RATS AND OF PROTEIN DEPRIVATION ON THE CAPACITY OF LIVER SLICES TO CONJUGATE BILIRUBIN.** *(E.)* Adlard, B. P. F. (Dept. Chem. Path., U. Leeds, Yorkshire, England), R. G. Lester and G. H. Lathe. *Biochem Pharmacol* 18(1):59-63, 1969.

In Wistar rats, oral phenobarbitone treatment (1 mg/ml in drinking water for 3 weeks) resulted in a 45% increase in the capacity of liver slices to conjugate and secrete bilirubin (total bilirubin conjugation 202 ± 22 compared to 146 ± 16 µg/g/2 hr in controls). Feeding a protein-free diet for 4 days had no significant effect on the amount of bilirubin conjugated by liver slices. Neither treatment altered the amount of conjugated bilirubin remaining in the liver slices at the end of the 2-hr incubation. Body weights, liver weights and liver weight/body weight ratios of animals treated with phenobarbitone were significantly greater than those of control rats. Animals fed the protein-free diet had liver weights and liver weight/body weight ratios which were significantly lower than those of the controls. In animals fed a control diet, addition of pregnanolone (2.5 x 10^{-5} M) and EDTA (5 x 10^{-4} M) to the incubation medium increased the conjugated pigment in the slices at the end of 2 hr of incubation. Taurocholate (1 x 10^{-3} M) increased conjugation but reduced the amount of pigment in the slices. In the phenobarbitone treated animals, EDTA was not inhibitory and taurocholate did not increase the rate of bilirubin conjugation. These observations indicate that the changes in bilirubin conjugation and secretion produced by phenobarbitone are minor compared to the several fold increases in the activity of NADPH-dependent, drug metabolizing and steroid-hydroxylating enzymes induced under similar conditions.

1149 **GLYCOGENOLYTIC EFFECT OF DIBUTYRYL CYCLIC ADENOSINE 3′,5′-MONOPHOSPHATE IN PERFUSED RAT LIVER.** *(E.)* Levine, R. A. (Brooklyn-Cumberland Med. Ctr., N.Y.) and S. E. Lewis. *Biochem Pharmacol* 18(1):15-20, 1969.

The glycogenolytic and hyperglycemic effects of the N^{6}-2′-O-dibutyryl derivative of cyclic adenosine 3′,5′-monophosphate (DBC) were compared with those of cyclic adenosine 3′,5′-monophosphate (3′,5′-AMP) and the 2′-O-monobutyryl derivative of 3′,5′-AMP (MBC) in isolated perfused rat liver. The hyperglycemic response to 7.8 mM/hr of DBC was significantly greater than that to an equimolar dose of MBC throughout 3 hr of infusion; there was no significant difference between the 2 butyl derivatives at the 4-hr blood glucose level. The enhanced potency of DBC was especially evident during the 1st 30 min of infusion when it produced a 70% greater glycemic response compared to MBC. The hyperglycemic response of DBC always exceeded that of 3′,5′-AMP at the equimolar dose. After 2 hr of infusion only DBC and MBC produced near-maximal glycogenolysis. A marked decrease in liver glycogen occurred as early as 2 hr after administration of DBC or MBC. After 4 hr of infusion the mean level of liver glycogen for DBC (0.6 ± 0.5 mg/g) was significantly lower than the 3′,5′-AMP value (9.1 ± 6.9 mg/g), but not significantly different from that with MBC (0.8 ± 0.5 mg/g). The mean difference between pre- and post-treatment liver glycogen values also was similar for DBC (32.2 ± 7.5 mg/g) and MBC (31.5 ± 7.7 mg/g), but significantly lower for 3′,5′-AMP (22.2 ± 3.0 mg/g). In acute injection studies, the glycemic responses to all 3 nucleotides were more variable than in the constant infusion experiments; yet, both DBC (0.2 mM) and MBC (0.2 mM) significantly exceeded the glycemic potency of an equimolar dose of 3′,5′-AMP. These data suggest that DBC penetrates the liver cell more readily or is less susceptible to hydrolysis by phosphodiesterase than either the monobutyrl derivative or the parent compound.

1150 **METABOLISM OF AMMONIA. I. BIOCHEMICAL ASPECT OF AMMONIA INTOXICATION.** *(E.)* Roberge, A. (Fac. Med., Laval U., Sainte-Foy, Canada.) and R. Charbonneau. *Rev Canad Biol* 27(4):321-331, 1968.

The accumulation of ammonia in the blood and body fluids in advanced hepatic diseases requires elucidation of the biochemical mechanisms of the production, fixation, and excretion of ammonia. The differential toxicity of ammonium salts, the relation of ammonia toxicity to blood pH, the effects of various compounds against the toxicity of these salts, the blood-brain barrier, and the role of arginine in ammonia intoxication have therefore been studied in male Wistar rats, mice and chicks. When 13 different ammonia salts were injected i.p. into rats at a dose of 10.6 mmoles NH_4-N/kg, the time of onset of convulsions ranged from 5 to 11 min after injection, and the time of death ranged from 6 to 13 min. However, the animals died without any sign of convulsions after injections of ammonium oxalate and citrate. After the injection of ammonium sulfate, bicarbonate and phosphate (acid, neutral and basic pH in that order), the time of onset of the comatose state was independent of blood pH variations but was related to the speed with which ammonia crossed the blood-brain barrier. The different dissociation speeds of the ammonium ion into free ammonia at the level of the cell membrane had a significant influence on the protective action of L-arginine, which completely protected rats against the effects of ammonium sulfate and phosphate. When L-arginine was given 15 min before ammonium bicarbonate, only 70% protection was observed. The most effective agents for the prevention of ammonia intoxication were L-arginine, L-citrulline, L-ornithine and L-ascorbic acid. The fact that labeled arginine and citrulline were not accumulated in the brain after i.p. injection, combined with the fact that these 2 amino acids and ornithine were ineffective against experimental ammonia intoxication in chicks, indicates that the protective effect was biochemical in nature.

1151 **INCREASE IN THE CELL-FREE PROTEIN SYNTHESIS OF STARVED RATS AFTER TREATMENT WITH PHENOBARBITAL.** *(Ger.)* Greim, V. H. (Inst. Toxicol., U. Tubingen, Germany). *Hoppe Seyler Z Physiol Chem* 349(12):1774-1776, 1968.

1152 **ISOLATION AND CHARACTERIZATION OF HUMAN LIVER ALDEHYDE DEHYDROGENASE.** *(E.)* Kraemer, R. J. (U. Colorado Sch. Med., Denver) and R. A. Deitrich. *J Biol Chem* 243(24):6402-6408, 1968.

1153 **PHOSPHOPROTEINS IN PLASMA MEMBRANES FROM RAT LIVER CELLS: ^{32}P INCORPORATION INTO PHOSPHOPROTEINS.** *(E.)* Blat, C. (Inst. Sci. Res. Cancer, Villejuif, France) and L. Harel. *Biochim Biophys Acta* 173(1):23-33, 1969.

1154 **EFFECTS OF PHOSPHOLIPIDS ON LIVER MITOCHONDRIA OSMOTIC PROPERTIES AND BINDING OF CATIONS.** *(E.)* Scarpa, A. (Inst. Gen. Path., U. Padua, Italy) and G. F. Azzone. *Biochim Biophys Acta* 173(1):78-85, 1969.

1155 **THE CHANGES IN THE STATE OF RAT LIVER CHROMATIN UNDER HYDROCORTISONE INDUCTION.** *(E.)* Salganik, R. I. (Inst. Cytol. Genet., Acad. Sci., Novosibirsk, USSR), T. M. Morozova and M. A. Zakharc *Biochim Biophys Acta* 174(2):755-757, 1969.

1156 **A STUDY OF THE CYTIDINE KINASE PATHWAY OF NUCLEOTIDE BIOSYNTHESIS IN REGENERATING RAT LIVER.** *(E.)* Krawitt, E. L. (McArd Lab. Cancer Res., U. Wisconsin, Madison), I. Betel and V. R. Potter. *Biochim Biophys Acta* 174(2):763-765, 1969.

1157 **ON THE STIMULATION OF ORNITHINE DECARBOXYLASE AND RNA POLYMERASE ACTIVITY IN RAT LIVER AFTER TREATMENT WITH GROWTH HORMONE.** *(E.)* Jänne, J. (Dept. Med. Chem., U. Helsinki, Finland) and A. Raina. *Biochim Biophys Acta* 174(2):769-772, 1969.

1158 **POLYPHENYLALANINE SYNTHESIS BY RAT LIVER RIBOSOMES DERIVED FROM POLYSOMES BY ETHIONINE TREATMENT *IN VIVO* OR BY PRE-INCUBATION *IN VITRO*.** *(E.)* Staehelin, M. (Biol. Labs Pharm. Dept., CIBA Ltd., Basel, Switzerland). *Biochim Biophys Acta* 713-721, 1969.

1159 **STUDIES ON RIBONUCLEIC ACID SYNTHESI IN NUCLEI ISOLATED FROM RAT LIVER.** *(E.)* Meisler, A. I. (Harvard Med. Sch., Boston, Mass.) and B. E. Tropp. *Biochim Biophys Acta* 174(2):476-490, 1969.

1160 **INTERACTIONS BETWEEN UNCOUPLERS ANI SUBSTRATES IN RAT-LIVER MITOCHONDRIA** *(E.)* Kraayenhof, R. (Lab. Biochem., B. C. P. Jansen Inst., U. Amsterdan, Netherlands) and K. Van Dam. *Biochim Biophys Acta* 172(2):189-197, 1969.

1161 **CYTOCHEMICAL STUDIES ON THE MECHANISM OF RAT LIVER REGENERATION: THE EFFECT OF PORTAL VEIN LIGATION ON THE LOCALIZATION OF ACID PHOSPHATASE ACTIVITY.** *(E.)* Vorbrodt, A. (Inst. Oncol., Gliwice, Poland) and W. Bartoszewicz. *Folia Histochem Cytochem* 6(2):203-211, 1968.

1162 **LIVER REGENERATION AFTER PARTIAL HEPATECTOMY IN RATS EXPOSED BEFORE THE OPERATION TO THE STRESS STIMULUS.** *(E.)* Simek, J. (Dept. Physiol., Charles U., Hradec Králové, Czechoslovakia), Z. Erbenová, F. Deml and I. Dvoracková. *Experientia* 24(11):1166-1167, 1968.

1163 **CARBOHYDRATE FORMATION FROM VARIOUS PRECURSORS IN NEONATAL RAT LIVER.** *(E.)* Vernon, R. G. (Dept. Biochem., U. Birmingham, England), S. W. Eaton and D. G. Walker. *Biochem J* 110(4):725-731, 1968.

1164 **THE NAD AND $NADH_2$ CONTENT OF THE LIVER, HEART, AND KIDNEYS OF ADRENALECTOMIZED AND ALCOHOL-TREATED RATS.** *(Ger.)* Fazekas, I. G. (Inst. Forensic Med., U. Szeged, Hungary) and B. Rengei. *Enzymologia* 36(1):59-64, 1969.

1165 **RAT LIVER D-β-HYDROXYBUTYRATE DEHYDROGENASE. III. INHIBITION BY TOPICAL ANESTHETICS.** *(E.)* Gotterer, G. S. (Johns Hopkins U. Sch. Med., Baltimore, Md.). *Biochemistry* 8(2):641-645, 1969.

1166 **THE ROLE OF AFFERENT BLOOD SUPPLY IN REGENERATION OF LIVER ISOGRAFTS IN RATS.** *(E.)* Lee, S. (U. California Sch. Med., San Diego), T. S. Edgington and M. J. Orloff. *Surg Forum* 19:360-362, 1968.

1167 **EFFECTS OF ACTINOMYCIN D AND X-RAY ON PARTIALLY HEPATECTOMIZED RATS.** *(E.)* Filler, R. M. (Child. Hosp. Med. Ctr., Boston, Mass.), C. L. Maddock, M. Tefft, G. F. Vawter and B. Brown. *Surg Forum* 19:358-360, 1968.

1168 **CORTICOSTEROIDS AND BILIRUBIN METABOLISM. [EDITORIAL]** *(E.)* Anonymous. *Gastroenterology* 56(2):363-366, 1969.

1169 **INFLUENCE OF INSULIN ON THE METABOLISM OF S^{35}-METHIONINE IN CUSHING'S SYNDROME.** *(E.)* Gozariu, L. (Inst. Med. Pharm., Cluj, Romania), O. Florescu, R. Dascălu, T. Holan and Z. Uray. *Rev Roum Endocrinol* 5(4):343-346, 1968.

1170 **STIMULATION OF PROTEIN SYNTHESIS IN MOUSE LIVER BY ECDYSTERONE.** *(E.)* Otaka, T. (Tohoku U. Sch. Med., Japan), S. Okui and M. Uchiyama. *Chem Pharm Bull* 17(1):75-81, 1969.

1171 **ADENOSINE TRIPHOSPHATE IN PREVENTION OF AMMONIA INTOXICATION IN DOGS.** *(E.)* Grossi, C. E. (St. Vincent's Hosp., New York, N. Y.), B. Prytz and L. M. Rousselot. *Surg Forum* 19:363-364, 1968.

1172 **THE ROLE OF THE LIVER AND SURGICAL STRESS IN ERYTHROPOIETIN METABOLISM.** *(E.)* Kukral, J. C. (Cook County Hosp., Chicago, Ill.), A. L. Carney, E. Ebroon, J. Pollitt, R. A. Zeineh, W. Dobryszycka and W. Fried. *Surg Forum* 19:348-349, 1968.

1173 **THE EFFECT OF X-IRRADIATION ON THE ACTIVITY OF NICOTINAMIDE DEAMIDASE IN RAT LIVER.** *(E.)* Zicha, B. (Med. Fac., Charles U., Prague, Czechoslovakia), L. Buric and J. Benes. *Strahlentherapie* 137(2):183-186, 1969.

1174 **THE ABILITY OF THE LIVER TO TAKE UP COLLOIDS AS STUDIED WITH THE AID OF ^{198}Au, WITH EMPHASIS ON THE RELATION BETWEEN UPTAKE AND VASOMOTOR FUNCTION.** *(Jap.)* Katano, T. (Nippon U. Med. Sch., Tokyo, Japan). *Nichidai Ig Z* 27(9):1020-1034, 1968.

1175 **THE EFFECT OF ESTRADIOL AND PROGESTERONE ON PORPHYRIN SYNTHESIS IN LIVER CELL CULTURES.** *(Ger.)* Doss, M. (Inst. Hyg., U. Marburg/Lahn, Germany). *Klin Wschr* 47(4):228-229, 1969.

See also: 1013,1017,1019,1113,1266,1538,1541,1555,1587,1590,1591,
1594,1609,1648,1719

1176 **STUDIES ON PHENOLIC STEROIDS IN HUMAN SUBJECTS. IX. ROLE OF THE INTESTINE IN THE CONJUGATION OF ESTRIOL.** *(E.)* Inoue, N. (Roswell Park Mem. Inst., Buffalo, N. Y.), A. A. Sandberg, J. B. Graham and W. R. Slaunwhite Jr. *J Clin Invest* 48(2): 390-396, 1969.

In order to compare the enteric circulation of estriol-16α-glucosiduronate (reported previously) with that of estriol (E_3), labeled estriol was administered to 6 women (28-55 yr old; 3 normal, 2 with uterine carcinoma, and 1 with a biliary fistula) by several routes: both injection and infusion into a systemic vein, injection into the portal vein, ingestion, and instillation into the jejunum and ileum. Urine, collected at varying intervals for up to 24 hr, was analyzed by countercurrent distribution for its content of radioactive estriol 3- and 16-glucosiduronate (E_3-3G1, E_3-16G1) and sulfoglucosiduronate (E_3-3S,16G1). After peripheral injection of E_3, E_3-16G1 was excreted rapidly and E_3-3S,16G1 was excreted at a slower and more constant rate. E_3-3G1 was barely detectable after infusion. After injection of E_3 into the portal vein, the excretion of E_3-3S,16G1 was greater and quicker than after peripheral injection. Ingestion also produced the same results. Only after instillation into the ileum was a large and rapid excretion of E_3-3G1 obtained, whereas the excretion of E_3-3S,16G1 and E_3-16G1 were depressed. These results and those previously reported suggest that E_3 does not readily appear in the small intestine except via a hepatoenteric circulation that produces very little E_3-3G1. When present in the distal segment of the small intestine, however, absorption, conjugation and elimination proceed readily.

1177 **ORIGIN AND RENEWAL OF GOBLET CELLS IN THE EPITHELIUM OF THE MOUSE SMALL INTESTINE.** *(E.)* Merzel, J. (Dept. Anat., McGill U., Montreal, P.Q., Canada) and C. P. Leblond. *Amer J Anat* 124(3):281-306, 1969.

Segments of duodenum, jejunum and ileum from adult female Swiss albino mice, previously injected i.p. with 1 μC thymidine-^{3}H/g and sacrificed 1 hr-14 days later, were analyzed for precursor cell types of goblet cells. A map of a jejunal crypt was reconstructed from 1-μ thick serial sections of Epon-embedded tissue. Typical goblet, columnar, Paneth and argentaffin cells were observed in the crypts, in addition to little-known cell types described as oligomucous, granulomucous and pale mucous cells. The oligomucous cells were especially numerous in the lower half of the crypts; they contained 1 or more mucous globules and cisternae of rough endoplasmic reticulum arranged concentrically as in goblet cells, but with fewer mitochondria than in columnar cells. The granulomucous cells were found throughout the crypt and contained granules within mucous globules which stained, like Paneth-cell granules, with iron hematoxylin. The pale mucous cells were only rarely found and showed the usual goblet-cell theca, but the cytoplasm and nucleus were pale as in argentaffin cells. Radioautography demonstrated that goblet, Paneth, and argentaffin cells were never labeled 1 hr after ^{3}H-thymidine injection and did not show mitosis, while columnar and oligomucous cells often showed mitotic figures and early labeling. Since label appeared in goblet cells 12 hr after injection, when significant amounts of ^{3}H-thymidine were no longer present in the circulation, the label could have come only from the transformation of oligomucous or columnar cells. The presence of all transitions between oligomucous and typical goblet cells and the similarity under the electron microscope of their Golgi networks and endoplasmic reticulum further indicated that oligomucous cells are the immediate precursors of goblet cells. Since not enough oligomucous cells were labeled to account for the turnover of the goblet cell population, it is suggested that some columnar cells are also involved as precursors of oligomucous cells.

1178 **PANETH AND GOBLET CELL RENEWAL IN MOUSE DUODENAL CRYPTS.** *(E.)* Troughton, W. D. (U. New Mexico Sch. Med., Albuquerque) and J. S. Trier. *J Cell Biol* 41(1):251-268, 1969.

Proliferation of Paneth and goblet cells of mouse duodenal crypts was studied by high-resolution light-microscope radioautography. In 1 group of mice, blood levels of thymidine-^{3}H were sustained for up to 12 hr by repeated isotope injections to facilitate identification of proliferating cells. In these animals, many goblet cell nuclei incorporated thymidine-^{3}H whereas only 1 of 6261 tabulated Paneth cells was labeled. A significant number of cells intermediate in structure between undifferentiated and goblet or Paneth cells incorporated thymidine-^{3}H into their nuclei. Another group of mice received a single injection of thymidine-^{3}H and were killed 4 hr to 29 days afterwards. Goblet and intermediate cells with labeled nuclei were identified 4 hr after the isotope administration, but could not be seen after 15 days. In contrast, Paneth cells with labeled nuclei were not observed until 24 hr after the isotope injection, but were still present after 29 days. It is concluded that differentiated Paneth cells in the mouse duodenum do not normally proliferate, but arise from undifferentiated or intermediate crypt cells by differentiation. Once formed, they persist in the crypts for prolonged periods. The intermediate cells noted are thought to represent transition forms between undifferentiated cells and the more mature secretory cells.

1179 **VITAMIN A AND PROTEIN SYNTHESIS BY RAT INTESTINAL MUCOSA.** *(E.)* De Luca, L. (Dept. Nutrit., Massachusetts Inst. Technol., Cambridge), E. P. Little and G. Wolf. *J Biol Chem* 244(3):701-708, 1969.

The effect of vitamin A deficiency on the elements of the protein-synthesizing mechanism of the intestinal mucosa was studied in weanling Holtzman albino rats fed a vitamin A-deficient diet; pair-fed normal controls received the same diet plus 2000 IU of vitamin A acetate/week. The common bile duct was ligated 18 hr prior to sacrifice of the animals. The small intestine was studied by electron microscopy and cell fractions from the intestine were prepared. In the vitamin A-deficient rats, a marked decrease in the number of goblet cells was noted, but no other morphological changes were revealed by electron microscopy. RNA and protein concentrations were unaffected, and no differences were found in polyribosome stability or the protein-synthesizing activity of free polyribosomes from the mucosa of vitamin A-deficient or pair-fed control rats. However, rough endoplasmic reticulum showe a decrease, to less than half normal values, in the uptake of abeled amino acids into protein in the vitamin A-deficient preparations. The mucosal lesion was noted to occur at an early stage of deficiency, before the weight plateau stage; however, it was not demonstrated in the liver. It is concluded that protein synthesis by membrane-bound, but not by free, polyribosomes of the intestinal mucosa is depressed in vitamin A deficiency and that the vitamin is probably involved in protein synthesis at the translational level.

1180 GLUCOSE METABOLISM IN THE MUCOSA OF THE SMALL INTESTINE: THE EFFECT OF GLUCOSE ON HEXOKINASE ACTIVITY. *(E.)* Shakespeare, P. (Dept. Med. Biochem., U. Birmingham, England), L. M. Srivastava and G. Hubscher. *Biochem J* 111(1):63-67, 1969.

The effect of 3 dietary components on hexokinase activity in the mucosa of the small intestine of female Wistar rats was studied *in vivo*. Diet I consisted of 10% glucose in water; diet II consisted of a 5% lipid emulsion containing palmitate and monopalmitin; diet III consisted of 10% hydrolyzed casein in water; and diet IV consisted of a mixture of glucose, casein, and lipid emulsion. Rats were fed the special diets by intubation over a 2-hr period after a 36-hr fast. Another group of starved rats were also given 45% glucose in water i.v. over a 2-hr period. Animals were sacrificed after the feeding period and intestinal segments were removed and incubated in Krebs-Ringer phosphate solution, after which hexokinase activity and glucose were determined.in the particle-free supernatant of mucosal homogenates. Of the 3 dietary components tested, only glucose brought about a return of hexokinase activity to the value seen in fed control animals; however, i.v. glucose had no effect on the hexokinase activity. Formation of lactate from glucose also returned to normal in the glucose-fed rats. The formation of lactate from glucose-6-phosphate was not significantly decreased by starvation, which may indicate that the changes in glycolysis seen in starvation are primarily due to changes in hexokinase activity. The results indicate that oral glucose is specifically required to return hexokinase activity to normal in the intestinal mucosa of starved rats.

1181 STUDIES ON THE ENZYMIC N-ACYLATION OF AMINO SUGARS IN THE SHEEP COLONIC MUCOSA. *(E.)* Allen, A. (Dept. Biochem., U. Oxford, England) and P. W. Kent. *Biochem J* 107(4):589-598, 1968.

D-(2-^{14}C) Glucose, (2-^{14}C) acetate, hydroxy (3-^{14}C) pyruvate, (3-^{14}C) pyruvate and (U-^{14}C)-glycine were incorporated into glycoprotein by surviving scrapings of sheep colonic mucosal tissue. Incorporation of (2-^{14}C) acetate, hydroxy-(3-^{14}C) pyruvate and (3-^{14}C) pyruvate resulted in labeling of each of the monosaccharide residues of the glycoprotein, i.e., N-glycollylneuraminic acid, N-acetylneuraminic acid, galactose, fucose, glucosamine and galactosamine. (U-^{14}C) Glycine was incorporated into the glycyl and seryl residues of the glycoprotein. Despite the fact that N-glycollylneuraminic acid is quantitatively the predominant sialic acid, the ratio of the radioactive labeling from D-(2-^{14}C) glucose in N-glycollylneuraminic acid to that in N-acetylneuraminic acid was 1.00:7.27 (expressed as percentages of the total radioactivity in the glycoprotein). Neutral sugar, hexosamine and N-acetylneuraminic acid residues of the mucoprotein were each labeled to a similar extent. The ratio of the radioactivity in N-glycollylneuraminic acid to that in N-acetylneuraminic acid in the mucoprotein from tissue incubated with (2-^{14}C) acetate was 1.0:4.0. When incubated with whole tissue, both (2-^{14}C) acetate and (2-^{14}C) glucose led to labeling of both the N-glycollyl substituent and the main nonose skelton of the N-glycollylneuraminic acid. In whole tissue incubations, (3-^{14}C) pyruvate was also a precursor of radioactive N-glycollylneuraminic acid. Hydroxy (3-^{14}C) pyruvate and (U-^{14}C) glycine caused labeling of the carbohydrate and peptide residues of the glycoprotein, but did not give rise to labeling in the N-glycollylneuraminic acid residues. With a wide variety of possible N-glycollyl precursors (frutose-6-phosphate, hydroxypyruvate, glycollate and chemically synthesized glycollyl-CoA), biosynthesis of N-glycollylglucosamine was not observed in cell-free preparations.

1182 INTESTINAL β-GALACTOSIDASES. I. SEPARATION AND CHARACTERIZATION OF THREE ENZYMES IN NORMAL HUMAN INTESTINE. *(E.)* Gray, G. M. (Stanford U. Sch. Med., Calif.) and N. A. Santiago. *J Clin Invest* 48(4):716-728, 1969.

Fresh specimens of small intestinal mucosa obtained during surgery or autopsy were analyzed by gel filtration chromatography and density gradient ultracentrifugation to characterize the human intestinal β-galactosidases. Gel filtration on Sephadex G-200 at pH 6.0 or on Biogel P-300 demonstrated 3 peaks of β-galactosidase activity in both supernatant and papain-digested particulate material from small intestine centrifuged at 100,000 x G. However, incomplete separation of the enzymes and significant loss of activity against synthetic substrates indicated that gel filtration was unsuitable for biochemical characterization. Density gradient ultracentrifugation on 5-20% sodium chloride or mannitol resulted in excellent separation of 3 intestinal β-galactosidases from supernatant material; particulate preparations contained 2 enzymes that appeared to be identical with enzymes I and II of the intestinal supernatant. Enzyme I showed a pH optimum of 6.0, molecular weight of 280,000 and specificity for lactose which was at least 5 times that for cellobiose or synthetic substrates. Enzyme II had a pH optimum of 4.5, demonstrated slightly greater activity against lactose than against some synthetic substrates and was incapable of splitting cellobiose. It occurred in 2 molecular species with molecular weights of 156,000 and 660,000. The trailing enzyme III, with a molecular weight of 80,000 was incapable of splitting lactose but hosed activity against synthetic β-galactosides. Its pH-activity curve was identical with that of enzyme I. Human liver and kidney appeared to contain an enzyme identical to that of intestinal enzyme II, suggesting that this is a ubiquitous enzyme, perhaps localized to lysosomes. The biochemical features of intestinal enzyme I indicate that this is probably the enzyme responsible for digestion of dietary lactose.

1183 INTESTINAL β-GALACTOSIDASES. II. BIOCHEMICAL ALTERATION IN HUMAN LACTASE DEFICIENCY. *(E.)* Gray, G. M. (Stanford U. Sch. Med., Calif.), N. A. Santiago, E. H. Colver and M. Genel. *J Clin Invest* 48(4):729-735, 1969.

In order to characterize the biochemical defect in intestinal lactase deficiency, pH-activity curves were obtained in whole intestinal homogenates obtained by biopsy from patients with lactase deficiency (11 children and adults with sprue or idiopathic lactase deficiency and 2 children with parasitoses). The pH optimum for intestinal lactase was shifted from a normal of 5.8 (observed in 10 patients with normal intestinal lactase activity) to 4.8 in the lactase-deficient patients. Five of the 13 patients had an additional minor peak of activity (less than 50% of the pH 4.8 peak) at pH 6.5. Density gradient ultracentrifugation of intestinal supernatant preparations from 5 patients with lactase deficiency demonstrated complete absence of the lactase with a pH optimum of 6.0 and molecular weight of 280,000 (enzyme I). Three of the 5 patients also were lacking enzyme III, the β-galactosidase which is specific only for artificial substrates. This enzyme, not a lactase, had a pH activity curve identical with that of the missing enzyme, and like enzym I, was capable of hydrolyzing β-glucosides as well as β-galactosid Its activity was inhibited both competitively and noncompetitively by lactose, but not glucose, suggesting that lactose binds with the enzyme. Enzyme II may represent a fragment or even a precursor of enzyme I. All lactase-deficient patients had normal levels of enzyme II (molecular weights of 156,000 and 660,000). The residual lactase activity provided by this lactase with a pH optimum of 4.5 accounted for 20-70% of the activity of the missing enzyme; yet these patients were unable to digest dietary lactose.

1184 **EFFECT OF ULTRAVIOLET AND DAY-LIGHT ON THE STEROL CONTENT IN THE SKIN AND INTESTINE OF RATS.** *(Uk.)* Ishchuk, O. Ie. (Inst. Biochem., Acad. Sci. Ukr. SSR, Kiev, USSR). *Ukr Biokhim Zh* 40(6): 631-634, 1968.

See also: 1017,1711

1185 **EFFICIENCY OF DIGESTION IN GERM-FREE AND CONVENTIONAL RABBITS.** *(E.)* Yoshida, T. (Dept. Microbiol., U. Notre Dame, Indiana), J. R. Pleasants, B. S. Reddy and B. S. Wostmann. *Brit J Nutr* 22(4):723-737, 1968.

Germ-free (GF) and conventional (CV) rabbits wearing collars to prevent coprophagy were fed autoclaved diets with added cellulose, and the fecal excretion was analyzed to determine nutrient digestibility. Clearly distinguishable hard feces were excreted by the GF rabbits only if the diet contained at least 15% cellulose. Unlike CV rabbits, the GF rabbits did not consume their soft feces even when permitted to do so. Soft feces made up a larger proportion of the total output of GF than of CV rabbits. Food intake and total dry-matter excretion/kg body weight were similar in both groups. Although the digestibility of dry matter was similar in the 2 groups, a higher digestibility of crude fat and true protein and a lower digestibility of crude fiber and nitrogen-free extract was noted in the GF rabbits. GF rabbits excreted a higher percentage of ingested calcium and phosphorus in the urine than did CV animals. The results suggest that intestinal microbes, even without the enhancing effect of coprophagy, aid in the digestion of carbohydrate in rabbits. The greater fecal excretion of crude fat and true protein by CV rabbits could result from poorer digestion and absorption, but could also represent nutrients synthesized by intestinal microbes from simpler materials.

1186 **COMPENSATORY CHANGES IN RENAL ELECTROLYTE EXCRETION TO REMOVAL OF GASTRIC HCl IN NORMAL AND UREMIC MAN.** *(E.)* Kiil, F. (Inst. Exp. Med. Res., U. Oslo, Norway) and E. Enger. *Scand J Clin Lab Invest* 22(4):277-287, 1968.

1187 **HORMONES OF THE DIGESTIVE TRACT.** *(Pol.)* Konturek, S. (1st Clin. Int. Dis., Acad. Med., Krakow, Poland). *Pol Tyg Lek* 24(1):26-28, 1969.

1188 **ACTIVATION, INHIBITION, AND pH-DEPENDENCE OF THE HYDROLYSIS OF α-N-BENZOYL-L-ARGININE ETHYL ESTER CATALYZED BY KALLIKREIN FROM PORCINE PANCREAS.** *(E.)* Fiedler, F. (Surg. Clin., U. Munich, Germany) and E. Werle. *Europ J Biochem* 7(1):27-44, 1968.

1189 **ACTION OF PEPSIN ON CATIONIC SYNTHETIC SUBSTRATES.** *(E.)* Hollands, T. R. (Dept. Biol. Biochem., Yale U., New Haven, Conn.), I. M. Voynick and J. S. Fruton. *Biochemistry* 8(2):575-585, 1969.

1190 **HUMORAL EFFECTS OF THE PANCREAS UPON THE GASTROINTESTINAL TRACT.** *(E.)* Singleton, J. W. (U. Colorado Med. Ctr., Denver). *Gastroenterology* 56(2):342-362, 1969.

1191 **EFFECTS OF VASOPRESSIN ON PORTAL VEIN PRESSURE IN THE UNANESTHETIZED MAN.** *(E.)* Kessler, R. E. (New York U. Sch. Med., N. Y.). *Surg Forum* 19:335-337, 1968.

1192 **FACTORS AFFECTING GASTRIC BLOOD FLOW IN THE UNANESTHETIZED RAT.** *(E.)* Wilken, B. J. (U. Mississippi Sch. Med., Jackson), M. D. Turner, D. G. Hunt and J. D. Hardy. *Surg Forum* 19:284-286, 1968.

DIAGNOSTIC PROCEDURES

1193 **PYLORIC VISUALIZATION WITH THE OLYMPUS GASTROCAMERA GT-5A AND GASTROCAMERA FIBERSCOPE GT-FA.** *(E.)* Paragas, P. D. Jr. (U. Wisconsin Med. Sch., Madison), W. B. Thorsen Jr., Y. Tanaka and J. F. Morrissey. *Gastroint Endosc* 15(3):145-148, 1969.

Gastrocamera examination of 235 subjects with normal gastrointestinal function permitted complete visualization of the pylorus. It appeared as a flat, round or oval opening 5-15 mm in diameter, devoid of folds radiating through it and often partially obscured by smaller lesser-curvature folds. In 63% of examinations with the GT-5A gastrocamera (57 of 90 cases), the pylorus was not visualized at all, whereas failures occurred in only 15% (8 of 55 cases) of examinations with the GT-FA gastrocamera fiberscope; all patients received 0.6 mg of atropine sulfate i.m. 20-30 min before the procedure. Intravenous injection of 6.0 mg of propantheline bromide 5 min prior to endoscopy reduced the failure rate to 41% (37 of 90 cases) for visualization with the GT-5A gastrocamera. This difference is thought to be due to the mode of administration, since both drugs caused similar antral aperistalsis.

1194 **INTEROBSERVER VARIATION IN GASTROSCOPY.** *(E.)* Goldstein, H. (VA Ctr., Los Angeles, Calif.). *Gastroint Endosc* 15(3):156-159, 1969.

In an effort to assess both interobserver variation in endoscopic examination of the stomach and the diagnostic accuracy of the procedure, 3 trained observers were asked to evaluate film strips from 49 patients examined with the GT V (30 cases) and GTF (19 cases) Olympus Gastrocamera. All 3 observers agreed as to diagnosis in 27 of 49 cases (55.1%) and completely disagreed in only 2 cases (4.1%). There was dissenting opinion in 20 instances (40.8%). Each of the 3 observers agreed with at least 1 other observer in 81.6%, 85.7%, and 79.6% of the instances. When the Gastrocamera strips were divided into normal (21 cases) and diseased (gastric ulcer, gastric cancer, benign tumor, hypertrophic or atrophic gastritis) films, there were 13 (15.7%) false negatives and 11 (17.6%) false positives. Each of the observers made the correct diagnosis in 81.6%, 75% and 75% of the cases, resp. When at least 2 of the 3 observers agreed, the diagnostic accuracy of the procedure was over 80%. Further clinical information in each case and additional observer experience probably would increase the sensitivity, specificity and diagnostic accuracy of the Gastrocamera examination.

1195 **THE VALUE OF LIVER SCANNING FOR DETECTION OF METASTATIC CANCER.** *(E.)* Ferrier, F. L. (Emory U. Sch. Med., Atlanta, Georgia), C. R. Hatcher, J. L. Achord and O. A. Abbott. *Amer Surg* 35(2): 112-120, 1969.

During the period 1963-68, 399 hepatic scans were performed with colloidal ^{198}Au on 386 cancer patients (41.7% with cancer of the lung or esophagus). Results were compared with liver function studies and correlated with histopathological information from needle liver biopsy, laparotomy with biopsy, or autopsy. There were 152 positive and 211 negative scans. Among 155 cases with histologic confirmation of hepatic metastasis, 50 of 59 (85%) positive scans and 81 of 96 (84%) negative scans were correctly interpreted, yielding an overall diagnostic accuracy of 84%. Simultaneous liver function studies in most patients gave correct positive diagnoses in 64% of alkaline phosphatase, 77% of BSP, 53% of SGOT and 30% of serum bilirubin determinations. Only 33%, 58%, 33% and 32% accuracy for these tests, resp., was achieved in patients with histologically proven negative scans. There were 9 (15%) false-positive liver scans; only 4 cases however, were shown to involve normal liver tissue, biopsy revealing cirrhosis in 1 patient, hepatitis in 2 and fatty degeneration in 2. Of 15 (16%) false negatives, evidence of metastatic disease to the liver was confirmed at autopsy in 9, at laparotomy in 6, and with needle biopsy in 6. It is suggested that liver scanning be used in conjunction with the results of hepatic function tests. It should also be performed prior to needle biopsy to reduce the number of false negative biopsies.

1196 **PERITONEOSCOPY: A CRITICAL REVIEW.** *(E.)* Babb, R. R. (Mercy Hosp., Baltimore, Md.), J. Notarangelo and V. M. Smith. *Gastroint Endosc* 15(3):162-169, 1969.

The diagnostic value of peritoneoscopy is evaluated on the basis of experience with 105 patients seen at Mercy Hospital during the period 1965-66 and reports in the literature. Indications for the procedure varied widely. Findings at peritoneoscopic examination confirmed the clinical impression in 49 cases, while in 40 cases they changed the clinical impression and altered treatment plans. The examination was not completed in 5 and was normal in 11 cases. No significant complications or mortality occurred. Peritoneoscopy was especially valuable in determining the etiology of hepatomegaly and ascites, in diagnosing metastatic cancer of the liver and peritoneum, in determining operability and curability in certain cancer patients, and in guiding needles for biopsy of selected tissues within the abdomen. Twelve patients were spared unnecessary surgery because of peritoneoscopic findings; including abdominal carcinomatosis, cirrhosis and tuberculous peritonitis. The procedure was of little help in diagnosing the cause of unexplained weight loss or fever, or obscure abdominal pain, or in differentiating between intra- and extrahepatic jaundice. A normal or negative peritoneoscopic examination does not exclude the presence of significant intraabdominal disease. The value of this safe procedure lies in its positive diagnostic potential.

1197 **WHIPPLE'S DISEASE: ROENTGEN FEATURES AND DIFFERENTIAL DIAGNOSIS.** *(E.)* Clemett, A. R. (Yale U. Sch. Med., New Haven, Conn.) and R. H. Marshak. *Radiol Clin N Amer* 7(1):105-111, 1969.

Roentgenographic studies on the small intestine in 16 cases of Whipple's disease revealed that the most prominent finding was the altered appearance of the mucosal fold pattern; the valvulae conniventes were thickened and slightly nodular, due to extensive infiltration of the lamina propria of the mucosa and submucosa by macrophages containing periodic acid-Schiff-positive material. The intestinal villi lost their finger-like configuration and became swollen and bulbous. The duodenum and jejunum were most severely, and the ileum only occasionally, affected. Other roentgen abnormalities in the small intestine (dilatation, increased secretions) were inconstant and lacked diagnostic significance. Stomach and colon examinations were normal. In only 1 case were extra-alimentary X-ray abnormalities of significance observed (chronic pericardial and pleural effusions). No evidence of lymphadenopathy was found. Other conditions that may produce diffuse thickening of the valvulae conniventes include amyloidosis, intestinal lymphangiectasia, histoplasmosis, some hypoproteinemic states, unusual cases of intestinal infiltrations associated with dysproteinemias, and rare cases of leukemia, lymphoma, systemic mastocytosis and giardiasis. Clinical findings and laboratory studies resolve the differential diagnosis in most cases. However, peroral intestinal biopsy is suggested in all cases to confirm the diagnosis.

1198 **CINEFLUOROGRAPHY OF THE GASTROINTESTINAL TRACT.** *(E.)* Jorgens, J. (Wadsworth Hosp., VA Ctr., Los Angeles, Calif.). *Radiol Clin N Amer* 7(1): 163-173, 1969.

Based on 9000 cinefluorographic examinations of the gastrointestinal tract performed at the Minneapolis VA Hospital during the period 1958-69, cinefluorography is evaluated as a teaching and diagnostic tool. Since the cinefluorographic examination depends on the experience of the cinefluorographer, the permanent picture film record of the fluoroscopic examination provides an excellent visual aid for teaching correct fluoroscopic techniques. It is especially valuable at a teaching hospital where residents can view and discuss many daily cinefluorographic films with their supervisors. The information provided by cinefluorography is well worth the extra time needed to film each patient, the additional cost of expensive equipment and the relatively heavy dose of radiation to the patient. Slow-motion studies (30-60 frames/sec) afford the most effective examination of the swallowing process and aid in detecting defects. At the usual speed of 15 frames/sec this technique proves highly effective in the detection of varices of the lower esophageal wall, but offers no particular advantage for viewing the mid esophagus. Peristaltic movements of the antral portion of the stomach are most adequately studied by cinefluorography. The observation of thickened folds in the antrum indicates an acute, healing or recently healed ulcer and makes exploratory surgery for suspected carcinoma unnecessary. Serial pictures (with the gastrofiberscope) and biopsies of the antrum also help to confirm the radiographic interpretations of antritis and cancer. Cinefluorographic study of peristaltic action through the duodenal loop often demonstrates a lesion at its earliest radiographically detectable stage; polyps and intramural tumors are readily detected by this technique.

1199 **ELUSIVE SMALL BOWEL BLEEDING: DESCRIPTION OF A NEW TECHNIQUE FOR THE DIAGNOSIS OF SMALL BOWEL TUMORS.** *(E.)* Lipshutz, S. N. (Encino, Calif.). *Amer Surg* 35(3):223-226, 1969.

A technique is described for localizing the source of elusive gastrointestinal bleeding. In the absence of positive upper-gastrointestinal, small-bowel or barium-enema findings, a small-caliber plastic tube is inserted through the nose into the gastrointestinal tract and allowed to be carried down by peristalsis and liquids. Random samples of aspirate are taken until blood is observed. The position of the tube can then be determined by radiographic markers and contrast medium introduced through the tube. The lesion can usually be visualized at this point; after establishing the diagnosis, appropriate surgical intervention should follow. Four case reports (2 men and 2 women, 50-76 yr old) illustrate the application of this technique to the detection of bleeding leimyomas with ulceration. This technique makes possible early and accurate detection of small intestine tumors associated with elusive bleeding.

1200 **ASSESSMENT OF LIVER SIZE.** *(E.)* Walk, L. (Cent. Hosp., Eskilstuna, Sweden). *Digestion* 1(5):289-295, 1968.

In a total of 700 cases, liver size was determined by a previously described roentgenological method (expressed as liver volume/m^2 body surface area) and compared to the assessment of liver size by physical examination. An upper limit of normal for liver volume was found to be 850 ml/m^2; 900 ml/m^2 or more was definitely pathological. Among patients with normal palpatory findings, only 76% had a radiologically normal liver volume and 24% had increased volumes. When the liver was palpated 1-2 fingerbreadths below the costal margin, 45% had a normal and 55% had an enlarged liver; when palpated at 3 fingerbreadths, 20% had a normal and 80% had an enlarged liver; at 4 fingerbreadths or more, 14% had a normal and 86% had an enlarged liver. Marked hepatomegaly was most frequently associated with severe steatosis, hepatitis, cirrhosis, and chronic myeloid leukemia. The roentgenological method for the determination of liver size is more reliable than physical examination of the patient, and slight deviations in liver size are identified with greater accuracy than by previously available methods.

1201 **GASTRIC EMPTYING IN RATS WITH CHRONIC GASTRIC FISTULAS.** *(E.)* Setler, P. E. (Dept. Physiol., U. Pennsylvania, Philadelphia) and G. P. Smith. *Amer J Dig Dis* 14(2):137-142, 1969.

A sensitive and convenient method for studying gastric emptying in male albino rats (Charles River Farms) equipped with chronic gastric cannulas is described which uses 0.01% phenol red dissolved in a 30% sucrose solution as a test meal. The stomach is gently lavaged and drained after a 20-hr fast, followed by 3 ml of the test meal injected at a rate of 2 ml/min through a gastric catheter inserted through a cork in the gastric cannula. After 5, 10 or 20 min, the gastric contents are withdrawn by gentle suction and the stomach is rinsed with 3 ml of water. The volume of the test meal emptied from the stomach is then calculated from the volume and phenol red concentration of the collected specimens. The sensitivity of this technique to anticholinergic effects was tested with dose-response studies using atropine s.c. 30 min before the test meal. The effects of atropine on balloon-recorded gastric motility were also studied by the recording of gastric motility waves. The half-time of the test meal was found to be 10 min. An average of 93% of the injected meal was recovered 10 min after atropine (1.0 mg/kg). No significant day-to-day variations in gastric emptying were noted within any 1 group of rats; however, there was significant variation among different groups. The degree of inhibition of gastric emptying varied directly with the atropine dose (50% decrease produced by 12.8 μg/kg). Atropine (10 μg/kg) eliminated the high-amplitude waves interspersed with regular low-amplitude waves recorded by the intragastric balloon. The technique described is a more sensitive detector of anticholinergic inhibition of gastric motor activity than either intragastric balloon recordings or gastric emptying methods using pellets rather than a liquid meal.

1202 **INSULIN POTENTIATION OF THE AUGMENTED HISTAMINE RESPONSE.** *(E.)* Checketts, R. G. (Royal Infirm., Glasgow, Scotland), I. E. Gillespie and A. W. Kay. *Gut* 9(6):683-687, 1968.

In 67 preoperative, male, duodenal ulcer patients, administration of insulin (10 U i.v.) 15 min before an augmented histamine test involving a single combined injection of mepyramine maleate (50 mg) and histamine acid phosphate (0.04 mg/kg) increased the gastric secretory response in 32 patients, inhibited the response in 7, and had no effect in 28. The timing for insulin administration was chosen to minimize the inhibitory effect of insulin on gastric secretion (about 30 min). Repetition of the augmented histamine test about 10 days after vagotomy in 44 patients showed a negative correlation between the effect of insulin on the test results and the difference between pre- and postoperative responses: the greater the increase produced by addition of insulin, the smaller the reduction in histamine response after vagal section. The wide variation in insulin effects suggests that these effects are related to spontaneous vagal activity and to insulin-induced release of acetylcholine at vagal nerve endings in each individual.

1203 **EVALUATION OF THE JIRGL REACTION FOR THE DIAGNOSIS OF JAUNDICE WITH INCREASED CONJUGATED BILIRUBIN.** *(Sp.)* Civeira, F. (Fac. Med., Zaragoza, Spain) and J. Diez-Antoñanzas. *Arch Fac Med Zaragoza* 16(3):269-275, 1968.

When Jirgl's test was run on 50 patients with various types of jaundice, positive tests were obtained in 22 of 25 patients with obstructive jaundice and increased conjugated serum bilirubin. One of the 3 patients with a negative Jirgl test had a mixed hepatocellular and obstructive jaundice and cirrhosis, but in the other 2 cases there was no obvious reason for the negative tests. Negative Jirgl tests were obtained in 15 of 22 patients with hepatocellular jaundice and increased conjugated serum bilirubin. It is suggested that the positive tests obtained in 7 cases might have been due to intracanalicular obstruction. Negative results were also obtained in 3 patients with increased nonconjugated bilirubin (2 with hemolytic and 1 with hepatocellular jaundice) and in 2 patients convalescing from obstructive jaundice.

1204 **MORBIDITY AND MORTALITY IN STANDARD AND FLEXIBLE GASTROINTESTINAL ENDOSCOPY.** *(E.)* Katz, D. (New York Med. Coll., N. Y.). *Gastroint Endosc* 15(3):134-141, 177, 1969.

A survey of endoscopic morbidity and mortality was conducted by a questionnaire circulated among members of the American Society for Gastrointestinal Endoscopy in 1967. Fibergastroscopy was found to be a relatively safe procedure, although the risk of perforation was seen to be slightly higher than that of standard gastroscopy (0.074% and 0.050%, resp.) and the mortality rate was greater (0.019% and 0.0033%, resp.). The risk of standard gastroscopy has remained unchanged from the results of a 1940 study. Although fiberesophagoscopy was rarely used at the time of this study, flexi-rigid esophagoscopy was found to have an increased risk (0.11% perforations) as compared to standard gastroscopy with a mortality figure equal to that of fibergastroscopy. More than 50% of the respondents to the questionnaire felt that the fibergastroscope visualized the proximal stomach poorly over 50% of the time and 70% felt that the fibergastroscope never entered the duodenum. It was also noted that the fibergastroscope appeared to have supplanted the standard gastroscope as the most popular instrument for the investigation of gastric disorders.

1205 **A STUDY OF THE ELECTROPHORETIC FRACTIONS OF LEUCINE AMINOPEPTIDASE IN THE DIAGNOSIS OF HEPATO-BILIARY DISEASES.** *(E.)* Apostolescu, I. ("N. Gh. Lupu" Inst. Intern. Med., Bucharest, Romania), A. Pappo, D. Motomancea, C. Vladescu and M. Zamfirescu-Gheorghiu. *Rev Roum Med Intern* 5(5):363-373, 1968.

In 10 healthy subjects, 12 with extrahepatic diseases, and 16 with hepatobiliary diseases without common bile duct obstruction, the maximum leucine aminopeptidase (LAP) activity was localized in the α_1 zone of the serum electrophoretogram. In 22 patients with choledochal obstruction (with or without jaundice), the peak LAP activity was found in the α_2 or β zones. This same localization was also noted in bile LAP-zymograms. In patients in whom surgical relief of the biliary obstruction was attained, the profile of the LAP-zymogram returned to the normal pattern. Maximum LAP activity in the α_2 or β fractions of the serum electrophoretogram thus suggests an obstruction of the common bile duct even when the total LAP activity is not increased, and a persistent abnormality in the serum LAP-zymogram after surgical relief of biliary obstruction suggests an ineffective surgical procedure.

1206 **TRANSAMINASE ACTIVITY IN CHRONIC HEPATITIS AND HEPATIC CIRRHOSIS.** *(Ger.)* Vido, I. (Munic. Hosp., Kassel, Germany) and E. Wildhirt. *Munchen Med Wschr* 111(6):277-281, 1969.

Histological findings and SGOT and SGPT activities were compared for 875 patients with chronic hepatitis and 464 with cirrhosis. Transaminase activities were abnormal in 25% of patients with moderate inflammation and in 75% of those during active stages of the disease. Patients with subchronic hepatitis had the largest percentage of abnormal transaminase activities and those with cirrhosis and portal hypertension had the smallest percentage of abnormal values. These findings demonstrate that histological examination of biopsied material gives a more reliable indication of inflammation than serum transaminase values.

1207 **ANALYSIS OF A CLINICAL TRIAL OF INTRAVENOUS BILE CONTRAST MEDIUM, IOGLYCAMIDE.** *(Ger.)* Barke, R. (Radiol. Clin., Karl Marx U., Leipzig, Germany), K. Neumeister, W. Taubert, B. Kunz and H. Reinhold. *Radiol Diagn (Berlin)* 9(5):573-582, 1968.

Intravenous cholangiograms were made on 376 patients, 52 of whom had undergone cholecystectomy. Exposures were made 20-120 min after injection on nonoperated patients and 10-90 min after injection on operated patients. Ioglycamide decreased blood pressure 10% or more in 73 of 360 patients and increased blood pressure in 19. The decrease in blood pressure was especially pronounced in patients with hypertension. Ioglycamide appeared to have less effect on blood pressure than adipiodone. Side effects occurred more frequently and were more severe in younger patients. Urticaria occurred with uncommon frequency, developing in 26 cases. Biliary colic was present in 1 case and 4 patients developed abdominal pain which was probably a form of abdominal angina. All but 12 (8%) of the exposures made 60 min after injection of contrast medium were of diagnostic value. Exposures were made longer after injection of ioglycamide than after adipiodone because of the higher renal excretion of the former. These findings indicate that there is little difference between the incidence of side effects and the quality of exposures obtained with ioglycamide and adipiodone.

1208 THE HISTOLOGICAL DIFFERENTIAL DIAGNOSIS OF CHOLESTASIS BY PUNCH LIVER BIOPSIES. *(Ger.)* Bianchi, L. (Inst. Path. Anat., U. Basel, Switzerland) and J. Moppert. *T Gastroent* 11(5):485-495, 1968.

No clear-cut distinctions were observed between the histological picture of jaundice in liver tissue biopsied from 81 patients with biliary tract obstructions and 76 with different forms of intrahepatic cholestasis. However, hepatocellular necrosis associated with bile pigment developed sooner in patients with obstructive jaundice and was accompanied by neutrophil infiltration and bile infarcts. Other changes characteristic of obstructive jaundice were parenchymal and mesenchymal changes secondary to cholestasis, edema and rounding off of Glisson's capsule, and dilatation and twisting of larger periportal biliary ducts with bile cylinders in their lumens and flattening of their epithelium. Leukocyte infiltration was also found in periportal bile ducts. Histological findings on 65 patients with intrahepatic cholestasis showed that 32 had only intrahepatic cholestasis, 11 had hepatitis with a suggestion of cholestasis, 3 had fatty liver with cholestasis, 5 had alcoholic liver disease with cholestasis, 8 had active chronic hepatitis, 1 had chronic, nonsuppurating, destructive cholangitis, and 5 had histologically unclassifiable lesions. Correct diagnoses of extrahepatic obstructions were established histologically in 76% of 81 cases; the diagnosis was doubtful in 19 cases. These findings indicate that the differential diagnosis of intra- and extrahepatic cholestasis cannot be based on histological findings alone.

1209 COMPARATIVE STUDY OF SOME SERUM ENZYMES IN JAUNDICE CAUSED BY VIRAL HEPATITIS, CIRRHOSIS AND OBSTRUCTION OF THE COMMON BILE DUCT. *(Fr.)* Gach, J. (Inst. Med., U. Liege, Belgium), J. Pirotte and L. Ruyters. *Acta Gastroent Belg* 31(11):738-746, 1968.

Serum GOT, GPT, alkaline phosphatase, and lactic dehydrogenase were determined in 45 patients with viral hepatitis, 23 with obstructions of the common bile duct (11 with choledocholithiasis, 4 with pancreatitis, and 3 with cancer of the head of the pancreas), and 15 with cirrhosis (11 with postnecrotic and 3 with alcoholic cirrhosis). Only patients with jaundice were studied. During the first week after the onset of jaundice a diagnosis of viral hepatitis can definitely be established if the SGOT, SGPT and lactic dehydrogenase are above 462, 238 and 620 Widal U, resp. The only parameter favoring a diagnosis of cirrhosis is an SGOT/SGPT ratio above 1.0 with low transaminase levels. A biliary obstruction is definitely present if the alkaline phosphatase is over 14.2 Bodansky U while the SGOT and SGPT are below 170 and 240 Widal U, resp. During the 2nd week after the onset of jaundice viral hepatitis is definitely present if the SGOT and SGPT are below 170 and 240 Widal U, resp. while the lactic dehydrogenase is above 948 Widal U. All 3 diagnoses are possible if transaminase values are lower than those mentioned above and the lactic dehydrogenase is below 756 Widal U. Biliary obstruction is definitely present if the alkaline phosphatase is above 18.6 Bodansky U, while values between 18.6 and 14.3 Bodansky U are compatible with a diagnosis of cirrhosis or biliary tract obstruction, and with an alkaline phosphatase level below 14.3 Bodansky U all 3 diagnoses are possible. A differential diagnosis cannot be made after the 2nd week of jaundice except in the case of obstructions due to cancer of the head of the pancreas in which the alkaline phosphatase activity increases continually.

1210 RADIOLOGICAL STUDY OF THE EFFECT OF ISOSUPRIN ON THE HUMAN STOMACH, DUODENUM, AND SMALL INTESTINE. *(It.)* Mattii, M. (Inst. Radiol., U. Bologna, Italy), B. Teofoli and L. Cammoranesi. *Arch Ital Mal Appar Dig* 35(2):152-160, 1968.

Radiological examinations were made before and after administration of 10 mg of isosuprin i.v. in 30 adult subjects who had no radiologically evident lesions of the gastrointestinal tract. Barium sulfate was given p.o. Isosuprin was not given to subjects with low blood pressure because of its hypotensive action. The drug consistently increased gastric tonus, peristalsis, and emptying. Barium sulfate passed through the small intestine quickly, reaching the cecum between 60 and 120 min after ingestion. The loops of the small intestine were dissociated from one another and their mucosa was visualized well. Isosuprin produced transitory headaches, faintness, sweating, and tachycardia in some cases. However, these symptoms were almost always relieved by administration of a few drops of an analeptic.

1211 PHARMACODYNAMIC EFFECTS OF METOCLOPRAMIDE ON THE LARGE INTESTINE IN MAN: STUDY WITH BARIUM ENEMAS. *(It.)* Mattii, M. (Inst. Radiol., U. Bologna, Italy), B. Teofoli and L. Cammoranesi. *Arch Ital Mal Appar Dig* 35(2):141-151, 1968.

After the colon was filled with a barium enema and abdominal surveys were made in a prone and supine position, 20 mg of metoclopramide was given i.v. to 50 patients. Exposures were made under the same conditions as above 5-7 min after injection of the drug. Metoclopramide increased the tonus of the cecum and ascending and transverse colon, producing small pendular movements there and large pendular movements at the base of the transverse colon and sigmoid. In some cases this was followed by elevation of the cecum with the appearance of contractile waves which rapidly spread to the ascending and transverse colon. Contrast medium accumulated in the descending colon and rectosigmoid. The use of metoclopramide is recommended in patients suspected of having parietal rigidity of the colon since it produces distension of the walls, relaxes spasms which might occur, and produces dissociation of twisted sigmoid loops. Spontaneous evacuation of the barium is usually complete, and the mucosal pattern can be seen better than without metoclopramide. None of the patients developed any signs of intolerance.

1212 THE FATE OF THE NONVISUALIZED GALLBLADDER. *(E.)* Achkar, E. (Lahey Clinic, Boston, Mass.), R. A. Norton and F. J. Siber. *Amer J Dig Dis* 14(2):80-83, 1969.

A study of 501 consecutive oral cholecystograms was undertaken to determine the reasons for nonvisualization by this procedure. These cholecystograms were performed on 490 patients (263 males and 227 females). Of the 490 patients, 423 had a normal gallbladder by the usual criteria, 44 had a visualized gallbladder containing stones, 23 had a nonvisualized gallbladder, and 21 had various degrees of impaired visualization. The 23 cases of nonvisualization included 7 in which this was ascribed to "technical factors", a previous cholecystectomy, or an interruption in the normal flow of contrast medium, 5 cases of cholelithiasis, and 4 of cystic duct obstruction. In 16 patients the study was repeated with a double dose of contrast material, an i.v. cholangiogram, or both. The i.v. cholangiogram was found to be of great value in further studies of gallbladder disease. Nonvisualization of the gallbladder by oral cholecystography does not necessarily mean gallbladder disease, but organic disease was present in approximately half of the patients in whom this occurred.

1213 PERCUTANEOUS TRANSHEPATIC CHOLANGIOGRAPHY: EXPERIENCE WITH 54 CASES.

(E.) Ritchie, G. W. (St. Boniface Gen. Hosp., Manitoba, Canada), D. C. Jackson and H. Eaglesham. *Canad Med Ass J* 100(3):110-116, 1969.

The value of percutaneous transhepatic cholangiography in the differential diagnosis of jaundice was assessed in 54 patients (20 males and 34 females). In 14 patients there was a failure to enter the bile duct and no direct information could be obtained about the biliary tree; 7 of these 14 were eventually found to have extrahepatic obstruction. In 39 of the 40 patients in whom the intrahepatic and extrahepatic bile ducts were observed, the conclusions were either essentially correct or of clinical value. The examination was successful in 36 of the 43 patients with obstructive jaundice and in 5 of the 11 patients with hepatocellular disease. Complications occurred in 6 patients (4 patients with bile peritonitis and 2 patients with hemorrhage) but there were no fatalities. These complications could have been avoided if the percutaneous transhepatic cholangiography had been done just prior to laparotomy.

1214 RADIO-CINEMATOGRAPHIC EXAMINATION OF THE RECTUM AND THE ANAL CANAL IN CASES OF RECTAL CONSTIPATION: A RADIO-CINEMATOGRAPHIC AND PHYSICAL EXPLANATION OF DYSCHEZIA.

(E.) Kerremans, R. (St. Rafael Acad. Hosp., Louvain, Belgium). *Acta Gastroent Belg* 31(8/9):561-570, 1968.

Radiocinematography of the anorectal region was carried out in a normal subject and 3 patients with chronic constipation due either to hypertonia of the puborectal bundle of the muscle levator ani or to rectocele. The most outstanding radiologic feature of the normal study was the angle between the direction of the rectum and the anal canal produced by contraction of the puborectal bundle of the levator ani; during evacuation, the angle became obtuse. In the young male with chronic constipation due to failure of relaxation of the puborectal bundle of the levator ani, the angle between the rectum and the anal canal was more pronounced than normal both at rest and during active contraction. Hence, at the moment of evacuation, defecation was difficult because this angle was maintained. In a woman with dyschezia due to rectocele, the blind pouch persisted during all stages of the investigation. At the moment of effort to evacuate, the rectocele filled further. In the 2nd patient with rectocele at an inferior level the pouch was not visible at rest, but it could be seen to fill when the effort to evacuate was made. Based on electromanometric measurements of pressures in the anal canal and in the rectum during various states of continence and defecation, a mathematical model to explain the competence of the anorectal system was proposed.

1215 DISTRIBUTION OF D-XYLOSE IN SEQUESTERED FLUID RESULTING IN FALSE-POSITIVE TESTS FOR MALABSORPTION.

(E.) Marin, G. A. (Philadelphia Gen. Hosp., Pa.), M. L. Clark and J. R. Senior. *Ann Intern Med* 69(6):1155-1162, 1968.

Blood levels and urinary excretion of D-xylose after a 25-g oral load were determined in 24 patients. Blood xylose levels were above normal in all cases. Normal urinary excretion of xylose was observed in 15 cirrhotic patients without ascites and in 2 patients with pleural effusion. In all 7 patients with ascites, however (5 cirrhotic patients and 2 patients with tuberculous peritonitis), urinary xylose excretion was below 4.5 g in 5 hr. All 7 patients with ascites also showed xylose in the ascites fluid for up to 23 hr. Low 5-hr urinary xylose excretion thus occurs in patients with ascites and may lead to a false-positive test for malabsorption.

1216 THE GASTRIC JUICE REDUCTION TEST IN THE DIAGNOSIS OF GASTRIC DISEASES.

(Pol.) Hruczkowska, E. (1st Clin. Int. Dis., Acad. Med. Lublin, Poland). *Pol Tyg Lek* 23(45):1726-1728, 1968.

A new test is proposed for the diagnosis of gastric diseases accompanied by hypo- or achlorhydria, resulting in the intragastric proliferation of bacteria and the consequent presence in the gastric juice of blood and tissue breakdown products. The test involves the dropwise addition of a 2% solution of methylene blue to a 5-ml sample of fasting gastric juice, a positive test being indicated by decolorization of the dye in 30-60 min at 37C. When the test was given to 150 patients (15-79 yr old) under treatment for a variety of digestive tract diseases, positive results were obtained in all 11 patients with gastric cancer and both patients with Addison-Biermer's disease, but in only 6 of 22 patients with gastric ulcers and only 7 of 115 with duodenal ulcers, hepatobiliary disease or other gastrointestinal diseases. These results tended to parallel the results of gastric analysis and tests for fecal blood. Thus, of the 26 patients with a positive reduction test, 21 had achlorhydria, 5 had hypochlorhydria, and 19 had blood in the feces.

1217 INVESTIGATION OF LIVER FUNCTION IN THE PRESENCE OF CHRONIC LIVER DISEASE BY STUDYING THE GLUCURONIDATION OF ^{131}I-LABELED o-IODOBENZOIC ACID AND BY MEANS OF THE TESTS WITH BSP AND ^{131}I-ROSE BENGAL.

(Cz.) Martinek, K. (3rd Clin. Int. Med., J. E. Purkyne U., Brno, Czechoslovakia), J. Dohnálek, M. Eysselt and A. Huvar. *Vnitrni Lek* 14(9):878-884, 1968.

The extent of glucuronidation of ^{131}I-labeled o-iodobenzoic acid (determined by measuring the urinary excretion of labeled metabolites after oral administration of 2 mg/kg of the acid) was compared with the results of the BSP and ^{131}I-Rose Bengal excretion tests in 82 healthy controls (38 men and 44 women, 19-71 yr old) and 220 patients (122 men and 98 women, 20-76 yr old) with various hepatobiliary diseases. In the healthy controls, 67 ± 10.7% of the urinary label was accounted for by o-iodobenzoylglucuronide, while 22 ± 10.3% was o-iodobenzoic acid and 7 ± 3.5% was o-iodohippuric acid. The average percentage accounted for by o-iodobenzoylglucuronide was increased in all groups of patients, being 70.1-70.7% in 15 patients convalescing from viral hepatitis and 45 patients with chronic cholecystitis, 79.0-83.5% in patients with portal cirrhosis and ascites, compensated portal or biliary cirrhosis, porphyria, chronic hepatitis or a previous cholecystectomy, and 87.2% in patients with liver metastasis. However, there was no direct correlation between glucuronide excretion and either the results of the BSP and Rose Bengal tests or the extent of liver damage as assessed clinically. While increased glucuronide excretion was seen in all 19 patients with biliary cirrhosis or liver metastasis, and in 62.1-81.8% of patients with prior cholecystectomy, porphyria, portal cirrhosis and chronic hepatitis, an abnormal BSP test (greater than 7% retention after 45 min) was obtained in all 12 patients with portal cirrhosis and ascites but in only 47.5-87.5% of patients with chronic hepatitis, porphyria, biliary or compensated portal cirrhosis, or liver metastasis, and in none of the 32 patients with a previous cholecystectomy. The results of the Rose Bengal test paralleled those of the BSP test.

1218 **SIGNIFICANCE OF THE DETERMINATION OF SERUM α-HYDROXYBUTYRATE DEHYDROGENASE ACTIVITY IN INTERNAL DISEASES.** *(Cz.)* Ninger, E. (3rd Clin. Int. Med., J. E. Purkyne U., Brno, Czechoslovakia), J. Továrek and J. Vojtková. *Vnitrni Lek* 14(9):885-893, 1968.

Serial serum α-hydroxybutyrate dehydrogenase (HBDH) and lactate dehydrogenase (LDH) levels were determined in 68 patients with a recent myocardial infarction and in 62 patients with various diseases of the liver. Although of considerable value in the diagnosis of myocardial infarction, especially in conjunction with LDH determinations, the serum HBDH was increased in only 4 of 25 patients with viral hepatitis, 3 of 4 with toxic hepatitis, 2 of 10 with decompensated cirrhosis, 2 of 13 with cholelithiasis and obstructive jaundice, and 5 of 10 with hepatoma. The average HBDH was above normal limits only in the groups with toxic hepatitis and hepatoma, while the average LDH was above normal in all groups and elevated LDH levels were noted in 15 of 25, 4 of 4, 5 of 10, 6 of 13, and 8 of 10 patients, resp. The increases in LDH were also quantitatively more significant than those in HBDH.

1219 **IMMUNODIAGNOSIS OF SCHISTOSOMIASIS. III. FURTHER PURIFICATION OF ANTIGEN SSCI BY DEAE SEPHADEX A50 COLUMN CHROMATOGRAPHY.** *(E.)* Sawada, T. (Sch. Med., Gunma U., Maebashi, Japan), S. Sato, K. Takei, J. W. Moose and J. E. Williams. *Exp Parasit* 23(2):238-243, 1968.

DEAE Sephadex A-50 column chromatography of antigen SSCI yielded antigens SSCDI, SSCD2, SST (SSCD3), SSCD4 and SSCD5. Antigen SST contained 660 γ of protein and 20 γ of carbohydrate per ml. Following an injection of 0.1 γ of protein antigen SST into 71 schistosomiasis patients intradermally, noticeable wheals over 7.0 mm in mean diameter appeared in 64 patients. Following an injection of antigen SST into 62 healthy individuals, wheals less than 7.0 mm in mean diameter appeared in 60 individuals. The borderline between positive and negative skin reactions is considered to be 7.0 mm. Accordingly, 90.1% positive reactions were obtained in the skin tests on 71 schistosomiasis patients in an endemic area and 3.2% false-positive reactions were obtained in the control tests on 62 healthy individuals in a nonendemic area. In the tests with antigen SST on 30 clonorchiasis patients 3.3% false-positive reactions were obtained.

1220 **THE VALUE OF LABORATORY ANALYSES IN THE DIAGNOSIS OF PANCREATIC DISEASES.** *(Ser.)* Dimković, D. (Clin. Hosp., Novi Sad, Yugoslavia), N. Obradović, M. Majdevac and M. Hadnadev. *Med Pregl* 21(5/6):197-199, 1968.

1221 **DIAGNOSTIC AND EPIDEMIOLOGICAL VALUE OF SERUM TRANSAMINASES IN THE EARLY DETECTION OF ACUTE INFECTIOUS HEPATITIS.** *(Ser.)* Jelić, O. (Med. Ctr., Slavonski Brod, Yugoslavia) and A. Jelić. *Lijecn Vjesn* 90(9):831-836, 1968.

1222 **REMARKS ON ENZYMOLOGICAL DIAGNOSIS IN GASTROENTEROLOGY.** *(Fr.)* Wieme, R. J. (Med. Clin., U. Ghent, Belgium). *Acta Gastroent Belg* 31(11): 711-714, 1968.

1223 **CARDIAC ARREST DURING CHOLEDOCHOSCOPY.** *(It.)* Grapulin, G. (Gen. Surg. Clin., U. Padua, Italy) and O. Fontanin. *Chir Gastroent* 2(4):478-481, 1968.

1224 **ANGIOGRAPHIC DIAGNOSIS OF LIVER METASTASES.** *(Pol.)* Wojtowicz, J. (Acad. Med., Poznan, Poland), A. Krokowicz, B. Grzybkowska and H. Szulc. *Pol Przegl Chir* 50(1):57-61, 1969.

1225 **THE VALUE AND LIMITATIONS OF COMPLEX FUNCTIONAL INVESTIGATIONS OF THE LIVER IN CHRONIC POSTVIRAL HEPATITIS.** *(Rum.)* Lungu, I. (Inst. Med. Pharm., Iasi, Romania), C. Strat, G. Russu, M. Dragan, E. Lungu, M. Solomon, I. Cobet and C. Stanciu. *Rev Medicochir Iasi* 72(3):621-624, 1968.

1226 **A RADIOISOTOPE TECHNIQUE FOR EVALUATING THE FUNCTIONAL STATE OF THE LIVER IN ANIMALS WITH TRICHODESMOTOXICOSIS.** *(Rus.)* Muratkhodzhaiev, N. K. (Uzbek Inst. Region. Med., Acad. Med. Sci. USSR), N. M. Zenovich and S. B. Matveiev. *Med Zh Uzbek* (10):84, 1968.

1227 **PERCUTANEOUS TRANSHEPATIC CHOLANGIOGRAPHY: ITS SIGNIFICANCE FOR THE DIAGNOSIS OF OBSTRUCTIVE JAUNDICE.** *(Ger.)* Junghanns, K. (Surg. Clin., U. Heidelberg, Germany), W. Wenz, G. Kolig and D. Beduhn. *Deutsch Med Wschr* 94(1):24-26, 1969.

1228 **THE EARLY DIAGNOSIS OF GASTRIC CARCINOMA (STATISTICAL AND CLINICAL FINDINGS, METHOD OF STUDY, AND PRACTICAL CONSIDERATIONS).** *(It.)* Marzi, M. (Santo Spirito Charit. Inst., Rome, Italy) and B. Sbuelz. *Chir Gastroent* 2(3):372-386, 1968.

1229 **TESTS OF PANCREATIC FUNCTION.** *(E.)* Mallinson, C. N. (Guy's Hosp., London, England). *Brit J Hosp Med* 1(2):161-167, 1968.

1230 **DIAGNOSIS OF AMEBIC LIVER DISEASE.** *(E.)* Ahuja, I. S. (Med. Coll. Hosp., Rohtak, India) *Punjab Med J* 18(4):137-144, 1968.

1231 **THE EFFECT OF ROSE BENGAL PURITY ON THE LIVER FUNCTION TEST. I. DETERMINATION OF RADIOCHEMICAL PURITY AND COMPARISON OF VARIOUS COMMERCIAL PREPARATIONS.** *(E.)* Raban, P. (Inst. Biophys., Charles U., Prague, Czechoslovakia). *Nuclearmedizin* 7(3):257-265, 1968.

1232 **A NEW PHYSICAL SIGN IN BILIARY-TRACT DISEASE.** *(E.)* Leake, R. A. (Bradford, England). *Practitioner* 201(11):804-809, 1968.

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1234 **RECTOSCOPY AND ITS COMPLICATIONS.** *(Pol.)* Madejski, T. (2nd Surg. Clin., Silesian Acad. Med., Katowice, Poland) and S. Tobik. *Pol Tyg Lek* 24(2):53-54, 1969.

1235 **USE OF THE WATER-LOADING TEST IN ESTIMATING THE DEGREE OF LIVER EFFICIENCY IN DISEASES ASSOCIATED WITH LIVER INJURIES.** *(Pol.)* Jasieński, S. (3rd Surg. Clin., Acad. Med. Krakow, Poland) and A. Gurak. *Przegl Lek* 24(8):645-649, 1968.

1236 **RECENT ADVANCES IN THE RADIOLOGY OF THE GASTROINTESTINAL TRACT.** *(Por.)* Kreel, L. (Royal Free Hosp., London, England). *Bol Sanat S Lucas* 30(3):79-85, 1968.

1237 **ACUTE RENAL INSUFFICIENCY OCCURRING AFTER OPACIFICATION OF THE BILIARY TRACT (REPORT OF 4 CASES).** *(Fr.)* Larcan, A. (Cent. Hosp., Nancy, France), C. Huriet, M. Calamai, M. C. Heully and J. Fays. *Ann Med Nancy* 7:937-945, 1968.

1238 **PHYSICAL SYMPTOMS REFLECTING THE FUNCTIONAL AND MORPHOLOGICAL FEATURES OF THE STOMACH.** *(Rus.)* Sobakin, M. A. (Inst. Nutrit., Acad. Med. Sci. USSR, Moscow). *Vestn Akad Nauk SSSR* 23(12):45-52, 1968.

1239 **ANESTHESIOLOGICAL PROBLEMS DURING BILIARY TRACT OPERATIONS IN WHICH RADIOMANOMETRY IS EMPLOYED.** *(Ger.)* Uray, É. (1st Surg. Clin., U. Debrecen, Hungary), C. Kósa and T. Nagy. *Chirurg* 40(2):90-92, 1969.

1240 **THE RADIOLOGICAL DIAGNOSIS OF ILEUS.** *(Ger.)* Schnepper, E. (Surg. Clin., U. Munster, Germany). *Chirurg* 40(2):53-57, 1969.

1241 **TECHNIQUE AND CLINICAL SIGNIFICANCE OF A NEW PANCREATIC LIPASE TEST WITH FLUORESCEIN DILAURATE.** *(Ger.)* Kaffarnik, H. (Med. Polyclin., U. Marburg, Germany) and J. G. Meyer-Bertenrath. *Klin Wschr* 47(4):221-223, 1969.

1242 **THE VALUE AND LIMITATIONS OF BLIND LIVER BIOPSIES.** *(Ger.)* Lindner, H. (German Red Cross Hosp., Hamburg). *Med Welt* 20(8):422-423, 1969.

1243 **THE DIAGNOSTIC VALUE OF INTRAVENOUS CHOLECYSTOGRAPHY AND CHOLANGIOGRAPHY IN DECOMPENSATED CARDIAC INSUFFICIENCY.** *(Ger.)* Gunther, H. (2nd Med. Clin., Humboldt U., Berlin, Germany), R. Bohm and B. Kunz. *Deutsch Gesundh* 24(1): 21-23, 1969.

1244 **EVALUATING THE WOFAVERDIN CLEARANC** *(Ger.)* Schmidt, D. (Hosp., Königs Wusterhausen, Germany) and G. Gudowski. *Deutsch Gesundh* 24(1):31-34, 1969.

1245 **CONTRAST PERITONEOGRAPHY IN THE DIAGNOSIS AND TREATMENT OF PERITONIT (EXPERIMENTAL STUDIES).** *(Ger.)* Galperin, Iu. M. (Lab. Pathophysiol., Moscow Regional Res. Inst., Moscow, USSR), B. M. Malkin and V. I. Petrov. *Radiol Diagn (Berlin)* 9(5): 543-550, 1968.

1246 **DIAGNOSIS OF CLOSED ABDOMINAL TRAUM** *(It.)* Campioni, N. (Queen Elena Inst. Study Treatment Tumors, Rome, Italy). *Policlinico [Prat]* 76(5): 133-144, 1969.

1247 **INTRAVENOUS CHOLANGIOGRAPHY: A STUDY OF 103 CASES.** *(Fr.)* van Lerberghe, R (Cesar De Paepe Clin., Brussels, Belgium) and Y. Laurent. *J Belg Radiol* 52(1):3-7, 1969.

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1249 **GASTRIC SECRETION AND THE DIAGNOSIS OF DUODENAL ULCERS.** *(Sp.)* Chulia Orti, F. (Prov. Hosp., Valencia, Spain) and R. Trullenque Peris. *Medicamenta* 26(458):352-356, 1968.

1250 **VALUE OF COMBINED TECHNIQUES IN THE RADIOLOGICAL DIAGNOSIS OF GASTRIC DISEASE.** *(Pol.)* Bryc, S. (Inst. Radiol., Acad. Med. Lublin, Poland), Z. Bieganowska, P. Misiuna and A. Zochowski. *Pol Tyg Lek* 23(45):1733-1734, 1968.

1251 **METHOD OF EXAMINATION OF GASTROENTEROSTOMY STOMAS: PRELIMINARY NOTE.** *(E.)* Shields, J. B. (John Cochran Veterans, Hosp., St. Louis, Mo.) and S. Holtz. *Invest Radiol* 4(2):104-105, 196

1252 **STUDIES ON THE DIAGNOSTIC VALUE OF LOCAL LEUKOCYTOSIS IN APPENDICITIS.** *(Ger.)* Schmauss, A. K. (Friedrichshain Munic. Hosp., Berlin, Germany) and R. D. Paulick. *Wien Med Wschr* 118(47):1018-1019, 1968.

1253 TRANSUMBILICAL CHOLANGIOGRAPHY AND SELECTIVE VENOUS PORTOGRAPHY IN PATIENTS WITH OBSTRUCTIVE JAUNDICE. *(E.)* Nahmad, M. H. (Albert Einstein Coll. Med., Bronx, N. Y.), C. A. Lankau, L. R. Del Guercio and C. H. Meng. *Surg Forum* 19:338-339, 1968.

1254 A METHOD OF MEASURING THE ALKALINE AREA OF THE STOMACH DURING OPERATION. *(E.)* Stoller, J. L. (U. Brit. Columbia Fac. Med., Vancouver, Canada), T. J. McDonald, P. J. Nunn and R. C. Harrison. *Surg Forum* 19:316-318, 1968.

1255 AN INTRAOPERATIVE TEST FOR COMPLETE VAGAL SECTION. *(E.)* Franks, C. D. (U. Kentucky Coll. Med., Lexington) and W. O. Griffin. *Surg Forum* 19:318-320, 1968.

1256 ON THE GASTRIC VARICES: ITS ROENTGENOGRAPHIC FEATURES AND DIAGNOSTIC METHOD. *(E.)* Nishioka, K. (Gifu U. Sch. Med., Japan), M. Shibayama, Y. Kanetake and E. Matsui. *Nippon Acta Radiol* 28(8):1180-1188, 1968.

1257 A STUDY ON THE PANCREATIC SCANNING USING ^{75}Se-SELENOMETHIONINE. *(Jap.)* Tsuchiya, S. (Chiba U. Sch. Med., Japan). *Nippon Acta Radiol* 28(8):1143-1159, 1968.

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1259 HOW TO GET A CLEAN COLON-WITH LESS EFFORT. *(E.)* Barnes, M. R. (U. Pennsylvania Hosp., Philadelphia). *Radiology* 91(5):948-949, 1968.

1260 SELECTIVE ARTERIOGRAPHY IN THE DIAGNOSIS OF HEMORRHAGE IN THE GASTROINTESTINAL TRACT. *(E.)* Baum, S. (U. Pennsylvania Sch. Med., Philadephia), G. N. Stein, M. Nusbaum and A. Chait. *Radiol Clin N Amer* 7(1):131-145, 1969.

1261 ROENTGENOGRAPHIC DIAGNOSIS OF PRIMARY DISORDERS OF ESOPHAGEAL MOTILITY. *(E.)* Zboralske, F. F. (Stanford U. Sch. Med., Palo Alto, Calif.) and W. J. Dodds. *Radiol Clin N Amer* 7(1):147-162, 1969.

1262 THE DISCOVERY OF GASTRIC ULCERS AND THE DIFFERENTIAL DIAGNOSIS BETWEEN BENIGNANCY AND MALIGNANCY. *(E.)* Nelson, S. W. (Ohio State U. Hosp., Columbus). *Radiol Clin N Amer* 7(1):5-25, 1969.

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1264 RADIOLOGIC DIAGNOSIS OF TROPICAL DISEASES OF THE GASTROINTESTINAL TRACT. *(E.)* Reedler, M. M. (Armed Forces Inst. Path., Washington, D. C.) and L. C. Hamilton. *Radiol Clin N Amer* 7(1):57-81, 1969.

1265 ENDOSCOPY AND BIOPSY OF THE COLON. *(E.)* Ottenjann, R. (Med. Clin., U. Erlangen-Nuremberg, Germany). *German Med Monthly* 13(12):611-612, 1968.

1266 INFLUENCE OF ANGIOGRAPHY CONTRAST MEDIA ON THE LIVER: AN EXPERIMENTAL AND CLINICAL STUDY OF TRIIODIZED CONTRAST MEDIA WITH SPECIAL EMPHASIS ON PROBLEMS CONNECTED WITH SURGERY. *(E.)* Engevik, L., S. Bengmark, C. M. Rudenstam, T. Schersten and B. F. Zackrisson. *Acta Chir Scand* (Suppl.392):5-85, 1968.

1267 ZINC CONTENTS IN GASTRIC JUICE IN NORMAL SUBJECTS AND PATIENTS WITH DISEASES OF THE STOMACH. *(E.)* Matsumoto, H. (Hokkaido U. Sch. Med., Japan), T. Shiraishi and K. Tsunematsu. *Med Biol (Tokyo)* 78(1):39-40, 1969.

1268 CONCOMITANT AORTOGRAPHY AND INFERIOR VENA CAVOGRAPHY IN PATIENTS WITH ABDOMINAL MASSES. *(E.)* O'Halloran, J. F. Jr. (New England Med. Ctr. Hosp., Boston, Mass.) and P. C. Kahn. *Arch Surg* 98(3):341-343, 1969.

1269 HOW IMPORTANT IS ENDOSCOPIC PREMEDICATION? [GUEST EDITORIAL.] *(E.)* Berry, L. H. (U. Illinois Med. Sch., Chicago, Ill.). *Gastroint Endosc* 15(3):170-171, 1969.

1270 ENDOSCOPIC EXAMINATION OF THE GASTRO-ESOPHAGEAL AREA. *(E.)* Dagradi, A. E. *Gastroint Endosc* 15(3):175-177, 1969.

1271 PITFALLS IN DIAGNOSIS OF ABDOMINAL STAB WOUNDS BY CONTRAST MEDIA INJECTION. *(E.)* Carter, J. W. (Vanderbilt U. Med. Ctr., Nashville, Tenn.) and J. L. Sawyers. *Amer Surg* 35(2):107-111, 1969.

See also: 1054,1075,1096,1174,1308,1442,1452,1494,1534,1550,1567

GASTROINTESTINAL DISEASES

ESOPHAGUS

1272 **EXPERIENCE WITH THE THAL AND NISSEN OPERATIONS IN THE TREATMENT OF REFLUX ESOPHAGITIS WITH STRICTURE: A PRELIMINARY REPORT.** *(E.)* Clarke, J. M. (U. Florida Coll. Med., Gainesville), J. E. Rayl and E. R. Woodward. *Amer Surg* 35(2):89-94, 1969.

The fundic patch esophagocardioplasty of Thal was performed in 9 patients (7 men and 2 women, 36-63 yr old) with benign distal esophageal strictures; Nissen's fundoplication was also performed in 5 of the 9 patients. A vagotomy, pyloroplasty and temporary gastrostomy was performed in 3 of 4 patients with the fundic patch operation only; the 4th patient had previously undergone gastric resection. All 4 of the latter patients had poor results, with prompt recurrence of esophagitis and strictures in 2 and severe bilious regurgitation in the other 2. Gastroesophageal reflux was demonstrated postoperatively in all cases. Subsequent fundoplication operations were performed on 2 patients and early follow-up revealed marked improvement in symptoms. Of the 5 patients who had fundic patch operations plus fundoplications, 4 showed good clinical results, and no postoperative reflux occurred. It appears that fundoplication forms a circumferential valve which is more effective in preventing reflux than the anterior valve spur described by Thal. Experimental studies on cadaver stomachs demonstrated the effectiveness of the flutter valve principle of the Nissen fundoplication in preventing reflux even with maximal pressure (85 cm water) in the stomach.

1273 **FUNCTIONAL DISORDERS OF THE PHARYNGO-ESOPHAGEAL JUNCTION: ACHALASIA AND CHALASIA.** *(E.)* Seaman, W. B. (Coll. Phys. Surg., Columbia U., New York, N. Y.). *Radiol Clin N Amer* 7(1):113-119, 1969.

The roentgenologic aspects of the normal and abnormal behavior of the cricopharyngeal sphincter are presented on the basis of reports in the literature and personal experience. Achalasia, characterized by the failure of inhibition of the normal high resting pressure of the cricopharyngeus during deglutition, so that the muscle is incompletely relaxed, manifests itself radiologically by a protrusion into the barium column from the posterior pharyngo-esophageal wall. In severe cases there is dysphagia and reflux of pharyngeal contents into the larynx and trachea and adequate roentgenography may be impossible. Any lesion that breaks or interferes with the coordinated neuromuscular chain of events involved in the normal relaxation of the cricopharyngeus (primary muscle disease, vagal paralysis, extensive head and neck surgery, central cranial nerve palsy, cerebrovascular disease affecting the brain stem) can cause cricopharyngeal achalasia. In 2 women (54 and 61 yr old) with polymyositis, poor pharyngeal contractions and failure of the cricopharyngeus to relax resulted in residual barium in the hypopharynx after completion of a swallow, the incompletely relaxed cricopharyngeus could be seen as a transverse radiolucent band at the pharyngo-esophageal junction. Cricopharyngeal achalasia may be an important factor in the pathogenesis of posterior pharyngeal diverticula of the Zenker type. Chalasia, in which the normal high resting pressure of the cricopharyngeus is reduced or absent, occurs only in myotonic dystrophy; hence it may be a specific diagnostic sign. In a 44-yr-old man with myotonic dystrophy, radiologic examination demonstrated a dilated esophagus and a continuous barium column between th pharynx and cervical esophagus, even when the patient was not swallowing. Cine-roentgenographic studies of swallowing functions in 7 patients with myotonic dystrophy (to be reported fully in a later publication) revealed this continuous column extending between the pharynx and esophagus during the resting phase between swallows (3 cases) and slow or delayed closure of the sphincter (4 cases).

1274 **FUNDOPLICATION FOR COMPLICATED HIATAL HERNIA: RATIONALE AND RESULT** *(E.)* Polk, H. C. Jr. (U. Miami Sch. Med., Fla.) and R. Zeppa. *Ann Thorac Surg* 7(3):202-211, 1969.

Nissen's fundoplication technique was used in 56 consecutive patients with radiographic (including cineradiography) or endoscopic evidence of esophagitis, stenosis, or free reflux of gastri contents into the esophagus. An extensive evaluation was mad to determine the presence or absence of coexisting disorders pertinent to decisions for or against operation as well as the selection of the operative approach. The primary indications for operation were: esophagitis (34), esophagitis and other lesions (12), lower esophageal ring (3), longitudinal stricture (3 suspected esophageal cancer (1), and other lesions only (3). The transabdominal approach was used in 34 patients (determining factors included biliary tract disease, ulcer disease, abdominal hernia and others) and the transthoracic approach wa used in 24 patients (determining factors included esophageal shortening, obesity, pulmonary lesions, and others). Coexisten lesions were treated routinely during the fundoplication procedure. Repair of the hiatal hernia with restoration of the eso phagogastric junction to an intraabdominal position was accom plished in all patients, with no operative mortalities. The tran abdominal approach was associated with more frequent and m serious complications (dehiscense in 3, wound infection in 1, esophageal fistula in 1, dumping symptoms in 1, and others in 2) than the transthoracic approach (atelectasis in 1, recurrent hernia in 1, and intercostal neuralgia in 2). None of the 56 patients examined 6-46 months after surgery had symptoms, roentgenological findings or endoscopic evidence of esophagitis or reflux. Fundoplication will be a useful and effective mode of therapy of complicated hiatal hernia if further follow-up studies maintain these early results.

1275 **ROLE OF ACID AND PEPSIN IN ACUTE EXPERIMENTAL ESOPHAGITIS.** *(E.)* Goldberg, H. I. (San Francisco Med. Ctr., U. California), W. J. Dodds, S. Gee, C. Montgomery and F. F. Zboralske. *Gastroenterolog* 56(2):223-230, 1969.

In an effort to produce a standard experimental model of acut esophagitis, solutions containing various concentrations of hyd chloric acid and porcine pepsin were infused into the esophag of 71 unanesthetized cats. A 1-hr infusion of 50 mEq/liter hydrochloric acid (pH 1.3) resulted in moderately severe esophagitis characterized by nearly complete epithelial erosion, w penetration of the basal layer in many areas. At 100 mEq/lit (pH 1.0), HCl produced severe esophagitis with proteinaceous edema and extensive proteolytic changes. Except for 1 anima infusion of 10 or 25 mEq HCl (pH 2.0 and 1.6, resp.) produc no injury to the esophagus, but the addition of pepsin (25 μg/cc HCl) was effective in causing mild to moderate esophagitis. Increasing the pepsin concentration above 25 μg (50, 100 or 200 μg/cc HCl) at pH 1.6 did not significantly increase the severity of the lesions. At pH 2.3 (5 mEq/liter HCl) the addition of pepsin (50 μg/cc HCl) did not result in esophagitis. Comparison of *in vivo* (esophageal proteins as substrate) and *in vitro* (hemoglobin as substrate) pH-pepsin activity curves suggested that pepsin digests protein by the same mechanism in both *in vivo* and *in vitro* systems. The addition of 20 mg of the synthetic pepsin inhibitor Depepsin to each cc of a solution containing 25 mEq/liter of HCl and 50 μg/cc HCl of pepsin prevented the production of esophagitis in 3 animals perfused for 1 hr. An acid-pepsin solution composed of 25 mEq/liter of HCl (pH 1.6) and 25 μg/cc HCl of porcine pepsin is suggested as a standard solution for the controlled production of esophagitis in the cat.

1276 **DIAGNOSIS OF PEPTIC ULCERS OF THE ESOPHAGUS AS COMPLICATIONS OF HIATUS HERNIAS.** *(Sp.)* de Arzua Zulaica, E. *Rev Esp Enferm Apar Dig* 28(1):15-24, 1969.

Peptic ulcers of the esophagus were diagnosed in 7 patients (6 males and 1 female, aged 11-63 yr). They included 2 with superficial ulcers, 4 with marginal ulcers of Wolf's type, and 1 with Barret's type. All patients had dysphagia and radiological evidence of passive esophageal reflux. In addition, 2 patients had epigastric pain, 2 had vomiting, and 1 had profuse hematemesis and melena. After surgery all patients were followed by histological and endoscopic examinations.

1277 **EVOLVING CONCEPTS REGARDING HIATAL HERNIA AND GASTROESOPHAGEAL REFLUX.** *(E.)* Davis, M. V. (3434 Swiss Ave., Dallas, Tex.). *Ann Thorac Surg* 7(2):120-133, 1969.

Among 601 patients admitted for hiatus hernia or gastroesophageal reflux during a 16-yr period, 294 came to surgery, including 40 treated by some modification of the Allison technique (all of whom had hernias) and 254 (92 males and 162 females, 3 months-83 yr old, including 56 without actual hernias) treated by the Belsey procedure. Based on experience with these patients, it is pointed out that symptoms and complaints due to gastroesophageal reflux may be either respiratory (cough, pharyngitis, layrngitis, bronchitis, pneumonitis, hemoptysis, asthmatic attacks) or esophagogastric (subxiphoid and substernal pain, flatulence, regurgitation of food or liquid dysphagia). In symptomatic patients the severity and frequency of reflux is the indication of pathology, whether a hiatal hernia is present or not, but almost all patients with hernia also have frequent gastroeophageal reflux. Cine studies or careful fluoroscopic examinations are essential in evaluating these cases. In the Allison repair group no morbidity or mortality was observed; only 8 patients suffered complications requiring treatment following Belsey repair, although all 254 showed gastric dilatation and 22 developed dysphagia. Among 260 patients followed for from less than 6 weeks to over 4 yr, there were 10 proven and 6 suspected recurrences. In the Belsey-repair group, 196 patients reported good to excellent, 36 fair to good and 22, poor results. It is suggested that the Belsey technique, modified as necessary, should be applied to those patients with significant, severe or threatening problems resulting from gastroesophageal reflux, whether or not a demonstrable hiatal hernia is present. This operation is not recommended for persons with allergic asthma.

1278 **THE ETIOLOGY, DIAGNOSIS, AND RESULTS OF TREATING ACQUIRED TRACHEOESOPHAGEAL FISTULAS.** *(Ger.)* Ringler, W. (Surg. Clin., U. Düsseldorf, Germany). *Thoraxchirurgie* 16(6):500-512, 1968.

Of 23 acquired tracheoesophageal fistulas, 9 were produced by malignant neoplasms, 2 by foreign bodies, 3 by trauma, 3 by tuberculosis, 2 by bronchiectasis, and 1 each by an esophageal diverticulum, esophageal stenosis, electrical burn of the esophagus, and a tracheostomy. In 2 cases it was difficult to determine from the history and histological findings whether the fistula was congenital or acquired. These patients included a 46-yr-old man who developed symptoms many years after a grenade fragment had lodged in his neck and a 62-yr-old man with a ruptured esophageal diverticulum. The diagnosis was made only at autopsy in 3 cases. Operations were performed on 10 patients, including 3 of those mentioned above. Of the 7 patients with no pulmonary complications the only fatality was a patient who committed suicide. One of 3 patients with a fistula involving the esophagus, trachea, and thoracic wall died 2 days after surgery with pulmonary edema.

1279 **THE SURGICAL TREATMENT OF THE CONSEQUENCES OF REFLUX ESOPHAGITIS.** *(Ger.)* Rossetti, M. *Langenbeck Arch Klin Chir* 322(Kongressber.): 379-387, 1968.

Of 817 patients with hiatus hernia and/or esophageal reflux, 88% had symptoms of reflux and cardial incontinence and 71 (9%) of these had advanced esophageal anomalies; these included 66 with secondary brachyesophagus and 5 with endobrachyesophagus. Stenosis was present in 28, a cardial ulcer in 11, massive bleeding in 5, a perforation in 2, and carcinomas in 11. Abdominal fundoplication was used to treat the reflux syndrome with cardial incontinence. This procedure was combined with vagotomy and abdominal pyloroplasty in patients with reflux syndrome and hyperacidity, peptic ulcer, endobrachyesophagus, and mild brachyesophagus. For severe brachyesophagus and recurrent hernias, thoracic vagotomy was combined with abdominal pyloroplasty. No fundoplications were performed on patients with cardial scarring. There were only 6 operative deaths among 727 patients with uncomplicated cardial incontinence and 7 among 63 patients with complicated forms.

1280 **ESOPHAGEAL COMPLICATIONS OF VAGOTOMY.** *(E.)* Postlethwait, R. W. (VA Hosp., Durham, N. C.), S. K. Kim and M. L. Dillon. *Surg Gynec Obstet* 128(3):481-488, 1969.

The incidence of esophageal perforation, devascularization, hemorrhage, dysphagia, hematoma, edema, fibrosis, esophagitis and hiatal hernia in 296 patients subjected to vagotomy are discussed and compared to the results of 4414 vagotomies reported in the literature. In the original series, in addition to 1 perforation, 3 cases of dysphagia, 1 of periesophageal fibrosis and 9 of esophagitis revealed by a review of the case records, a follow-up examination of 135 patients 6 months to 5 yr after vagotomy revealed 15 hiatal hernias; all, however, were asymptomatic. In the 4414 reported cases, the incidence of perforation was 0.54% and that of dysphagia was about 3.6%, with wide fluctuations. The cause, prevention and treatment of these complications are discussed. Excessive dissection is to be discouraged, and restoration of anatomic structures to anchor the cardia in its normal position is probably indicated.

1281 **TRAUMATIC DIAPHRAGMATIC HERNIA: CLINICAL CONSIDERATIONS AND TECHNIQUES OF SURGICAL REPAIR.** *(Sp.)* Garriz, R. A. (Rawson Hosp., Buenos Aires, Argentina), H. Santangelo and J. A. Rodriguez Martin. *Prensa Med Argent* 55(30):1474-1478, 1968.

1282 **SIMULTANEOUS ADENOCARCONOMA OF THE ESOPHAGUS AND STOMACH. [CASE REPORT]** *(E.)* Peison, B. (Mercy Hosp., Chicago, Ill.). *Illinois Med J* 134(6):742-747, 1968.

1283 **NEUROLOGICAL SPASMS IN DISORDERS OF THE ESOPHAGUS.** *(Rus.)* Bogolepov, N. K. (Pirogov 2nd Moscow Med. Inst., USSR) and N. I. Vorontsova. *Zh Nevropat Psikhiat Korsakov* 58(12):1753-1760, 1968.

1284 **TRAUMATIC PERFORATIONS OF THE ESOPHAGUS.** *(Sp.)* Nahmias, M. (San Martin Polyclin., Villa Ballester, Argentina), J. Gimbatti and A. Grandi. *Prensa Med Argent* 55(19):880-882, 1968.

1285 **ESOPHAGEAL DIVERTICULA AND CANCER.** *(Fr.)* Piaget, F., R. Charachon, J. C. Gros, C. Junien La Villauroy and M. Dezani. *J Franc Otorhinolaryng* 17(9):751-754, 1968.

1286 **BRACHYESOPHAGUS.** *(It.)* Montagnini, R. (Fatebenefratelli Hosp., Rome, Italy) and A. Mancia. *Policlinico [Chir]* 75(5):290-318, 1968.

1287 **HIATUS HERNIA - THE CASE FOR REPAIR BY THE ABDOMINAL APPROACH.** *(E.)* MacGowan, W. A. L. (Royal Coll. Surg. Ireland, Dublin). *Irish J Med Sci* 1(10):475-481, 1968.

1288 **HEMORRHAGE IN ESOPHAGEAL HIATUS HERNIA.** *(Rus.)* Dibizheva, G. V. (Cent. Inst. Postgrad. Med., Moscow, USSR). *Ter Arkh* 40(10):52-55, 1968.

1289 **TREATMENT OF BLEEDING ESOPHAGEAL VARICES WITH A DERIVATIVE OF VASOPRESSIN.** *(Ger.)* Schröder, P. (St. Elisabeth Hosp., Cologne-Hohenlind, Germany). *Med Welt* 20(8):436-437, 1969.

1290 **THE DIAGNOSIS AND TREATMENT OF HIATUS IN INFANTS AND YOUNG CHILDREN.** *(Ger.)* Hartmann, G. (Surg. Clin., Schiller U., Jena, Germany), G. Göring and E. Baudisch. *Deutsch Gesundh* 24(7):311-316, 1969.

1291 **THE TREATMENT AND OUTCOME OF ACUTE BLEEDING FROM ESOPHAGEAL VARICES.** *(Ger.)* Koncz, J. (Surg. Clin., U. Göttingen, Germany), L. Brunner, B. Heisig and R. Stunkat. *Chirurg* 40(3):111-117, 1969.

1292 **FAILURE OF THE ESOPHAGEAL VOICE AS AN EARLY SYMPTOM OF ESOPHAGEAL CANCER.** *(Ger.)* Breuninger, H. (Otorhinolaryng. Clin., U. Tübingen, Germany). *Z Laryng Rhinol Otol* 47(12):940-942, 1968.

1293 **MECHANISM OF CLOSURE OF THE TERMI ESOPHAGUS.** *(E.)* Steizner, F. (Dept. Surg., Hamburg-Eppendorf, Germany). *German Med Monthly* 13(563-568, 1968.

1294 **PYLOROPLASTY VERSUS ANTRECTOMY: EVALUATION BY MEANS OF AN EXPERIMENTAL REFLUX ESOPHAGITIS MODEL.** *(E.)* Rowley M. M. (Creighton U. Sch. Med., Omaha, Neb.), R. L. Belmo P. S. McGreevy, D. N. Houchin and F. A. Miller. *Surg For* 19:321-323, 1968.

1295 **HOWARD'S METHOD FOR THE TREATMEN OF ESOPHAGEAL ATRESIA WHEN IMMED ANASTOMOSIS IS IMPOSSIBLE.** *(Fr.)* Jaubert de Beauje M. (Debrousse Hosp., Lyon, France), P. Mollard, A. Campo- Paysaa and A. Bochu. *Ann Chir Infant* 9(4):289-296, 1968

1296 **THE TREATMENT OF RARE TYPES OF ES AGEAL ATRESIA BY A MULTISTAGE PROCEDURE.** *(Fr.)* Prévot, J. (U. Hosp. Ctr., Nancy, France) J. M. Babut. *Ann Chir Infant* 9(4):297-302, 1968.

1297 **PLANT-CELL EMBOLISM IN THE LIVER O PATIENT WITH AN ESOPHAGEAL ULCER.** *(Ger.)* Hort, W. (Inst. Path., U. Gottingen, Germany) and T Shozawa. *Zbl Allg Path* 111(5):525-528, 1968.

1298 **ELECTRON MICROSCOPIC OBSERVATION OF THE KERATINIZATION OF THE MUCO EPITHELIUM OF THE ESOPHAGUS.** *(E.)* Muto, H. (Nag City U. Med. Sch., Japan). *Med Biol (Tokyo)* 78(1):15-18, 1969.

1299 **PHYSIOLOGY AND PATHOPHYSIOLOGY O THE CARDIA AND LOWER ESOPHAGUS.** *(Ger.)* Borst, H. G. (Hannover, Germany) and R. Earlam. *Langenbeck Arch Klin Chir* 322(Kongressber):340-349, 196

1300 **DYSPHAGIA CAUSED BY TORTUOSITY OF THE THORACIC AORTA.** *(E.)* Hanna, E. A (U. Texas Med. Br., Galveston) and J. R. Derrick. *J Thorac Cardiovasc Surg* 57(1):134-137, 1969.

1301 **AORTIC BYPASS IN THE MANAGEMENT O AORTOESOPHAGEAL FISTULA. [CASE R PORT]** *(E.)* Yonago, R. H. (Stanford U. Sch. Med., Palo Calif.), A. B. Iben and J. B. Mark. *Ann Thorac Surg* 7(3):2 237, 1969.

1302 **LIGATION OF SALIVARY GLAND DUCTS ESOPHAGEAL CARCINOMA. [CASE REPO** *(E.)* Johner, C. H. (Dept. Otolarying, Maxillofacial Surg., Northwestern U., Chicago, Ill.) and H. R. Konrad. *Ann T Surg* 7(3):246-248, 1969.

1303 **ESOPHAGEAL RECONSTRUCTION AND R PLACEMENTS.** *(E.)* May, I. A. (Highland G Hosp., Oakland, Calif.) and P. C. Samson. *Ann Thorac Sur* 7(3):249-277, 1969.

See also: 1069,1204,1261,1270

STOMACH

(Gastric ulcer is placed with peptic ulcer)

304 **BLOOD GROUP ACTIVITIES IN WATER-
SOLUBLE GLYCOPROTEINS AND IN MICRO-
OMAL FRACTIONS OF GASTRIC MUCOSA IN PEPTIC
LCER AND GASTRIC CANCER PATIENTS.** *(E.)*
äkkinen, I. P. T. (Dept. Microbiol., U. Turku, Finland),
. Raunio, S. Virtanen and J. Kohonen. *Clin Exp Immunol*
(1):149-157, 1969.

BH blood group activity in the water-soluble glycoproteins
f human gastric mucosa was investigated in 26 tissue speci-
ens from 10 cases of peptic ulcer and in 90 specimens from
cases of gastric cancer. Subcellular fractions were also ana-
yzed for blood group activity. Using the microplate technique
f hemagglutination inhibition, the secretion of A-H or B-H
ctive substances was found to be relatively homogeneous in the
otal gastric mucosal area. There were no unusual variations
n the titers obtained. Samples showing no blood group activity
vere occasionally found in cancerous gastric mucosa; usually
he deficiency was in H-activity, but 4 samples from 1 cancer
atient demonstrated no B-activity as well. Two cases of peptic
lcer and 4 of cancer revealed additional noncompatible A-ac-
ivity in the gastric mucosa, each in 1 sample. This may have
een due to the alteration of genetic material or a change in in-
ibition of the enzymatic system already present. H-activity
vas present in addition to A- or B-activity in the supernatant
raction of gastric mucosal cells from A or B persons, resp.,
ut H-activity was totally lacking in the microsomal fractions
vhich also contained considerable A- or B-activities. H-activity
vas often observed in all fractions derived from O individuals.
Additional noncompatible A-activity was found in the micro-
omal fraction from 2 cancerous stomachs and 1 with peptic
lcer. The lack of H-activity in the microsomal fraction of A
or B persons supports the hypothesis that the biosynthesis of
such glycoproteins involves the incorporation of completed
oligosaccharides into the growing polypeptide molecule. Enzy-
matic modification of the glycoproteins in a later step could
explain the simultaneous occurrence of H-activity in the secre-
tion products.

1305 **INTRAGASTRIC PHOTOGRAPHIC OBSERVATION OF THE EFFECTS OF SMOKING ON GASTRIC MUCOSA.** *(E.)* Hoon, J. R. (Sheboygan Clin., Wis.). *Gastroint Endosc* 15(3):172-174, 1969.

The appearance of the gastric mucosa was evaluated with the GTF gastrocamera with fiberscope before and immediately after 5 subjects smoked their 1st cigarette of the day, and before and after 1 additional subject smoked first a cigar and then a cigarette. The gastrocamera was inserted after pharyngeal medication with lidocaine; the patient was then allowed to smoke for a period which usually lasted 4 min, and the camera was promptly reinserted (after only silicone repolishing of the lens) in approximately the same location in the stomach. No change in the the color intensity of the gastric mucosa was observed in 1 habitual smoker after smoking a cigarette or in another smoker after smoking a cigar and later a cigarette. However, in 2 nonsmokers and in 2 regular ("pack-a-day") smokers, pallor of the mucosa followed smoking of a cigarette for about 4 min. These observations indicate that there is vasoconstriction in the gastric mucosa following cigarette smoking.

1306 **EVALUATION OF GASTRIC ACID AS A FACTOR IN DRUG-INDUCED GASTRIC HEMORRHAGE IN THE RAT.** *(E.)* Brodie, D. A. (Merck Inst. Ther. Res., West Point, Pa.) and B. J. Chase. *Gastroenterology* 56(2):206-213, 1969.

The mechanism of drug-induced gastric hemorrhage was studied in male Holtzman rats given maximal ulcerogenic doses of aspirin (128 mg/kg p.o.), phenylbutazone (128 mg/kg p.o.), serotonin (8 mg/kg s.c.), 2-deoxyglucose (256 mg/kg s.c.), reserpine (32 mg/kg i.p.) and histamine (256 mg/kg s.c.). Vagotomy produced a significant decrease in gastric hemorrhage (measured at 6 hr for reserpine and at 4 hr for all other drugs) following the administration of aspirin, phenylbutazone, 2-deoxyglucose and reserpine, but did not reduce gastric bleeding in rats treated with serotonin and histamine. The incidence of gastric hemorrhage in vagotomized rats was returned to control levels when 2 ml of 0.075 M hydrochloric acid was instilled into the stomachs of rats treated with aspirin and reserpine, but not in the case of phenylbutazone and 2-deoxyglucose (although it was increased above that seen in animals given the acid alone). In 4-hr vagotomized acute fistula rats, only histamine increased the gastric acid concentration to sham-vagotomized control levels; none of the drugs produced an increase in titratable acid output that approached the control level in sham-vagotomized animals. Studies on gastric secretion in the acute fistula rat demonstrated that only 2-deoxyglucose increased any parameter of gastric secretion above control values (significantly increased gastric acid concentration), while serotonin, histamine and reserpine did not change the titratable acid concentration, and aspirin and phenylbutazone significantly decreased the acid concentration. None of the drugs increased titratable acid output and only 2-deoxyglucose did not produce a marked depression of acid output. In pyloric-ligated rats infused with 3.0 ml glycine (to trap spontaneously secreted HCl), a significant reduction of hydrogen ion output occurred with aspirin, serotonin, histamine and phenylbutazone. This decrease in gastric secretion was not attributable to loss of secreted HCl through the damaged gastric mucosa. There appears to be no common mechanism among these 6 drugs for the production of gastric bleeding.

1307 **THE EFFECT OF FOOD ON ASPIRIN INDUCED GASTRO-INTESTINAL BLOOD LOSS.** *(E.)* Stephens, F. O. (Sydney Hosp., Australia), E. J. Milverton, C. K. Hambly and E. K. van der Ven. *Digestion* 1(5):267-276, 1968.

The gastrointestinal blood loss following aspirin ingestion between and with meals was compared. Each of 16 male volunteers without gastrointestinal disorders received 20 cc of ^{51}Cr-labeled blood (their own), and stool specimens were collected for the determination of fecal blood volumes using a well-counter apparatus over a 4-day basal period. Berinning on the 5th day, 900 mg of aspirin was given 3 times daily to 8 subjects 2 hr before meals (group I) and to 8 subjects during meals (group II), for 7 consecutive days; fecal blood loss was determined daily and for 5 days after the last aspirin dose. During the pre-aspirin control period, there was an average daily blood loss of 1.3 ml in group I and 1.2 ml in group II. During the period of aspirin ingestion a significant increase in average daily blood loss was noted, to 3.8 ml in group I and 5.0 ml in group II;

the difference between the 2 groups, however, was not significant. During the post-aspirin period, an average daily loss of 2.9 ml in group I and 2.6 ml in group II was noted. It is concluded that fecal blood loss is not reduced when aspirin tablets are given during meals as compared to between meals.

1308 VAGOTOMY AND PYLOROPLASTY: A CINERADIOGRAPHIC STUDY. *(E.)* Gleeson, J. (Westminster Hosp., London, England) and H. Ellis. *Amer J Dig Dis* 14(2):84-95, 1969.

Cine barium-meal studies were performed on 29 patients (21 males and 8 females, 17-71 yr old) 1 month to 5 yr after a Heineke-Mikulicz pyloroplasty and on 13 patients (11 males and 2 females, 30-63 yr old) 4 days to 15 months after a Finney pyloroplasty. All patients had a vagotomy and were asymptomatic. In both groups, a consistent gastroduodenal deformity was observed: in those with a Heineke-Mikulicz procedure, large pseudodiverticula were observed in the pyloric canal and muscular impressions indented the canal; in those with a Finney procedure, a translucent line indented the barium-filled stomach, attributed to a ridge of tissue at the suture line. It is concluded that pseudodiverticula occur in the normal postoperative state, and must be differentiated from peptic ulcers.

1309 HYPERPLASIA OF THE GASTRIC MUCOSA PRODUCED BY DUODENAL OBSTRUCTION. *(E.)* Crean, G. P. (Clin. Endocrin. Res. Unit, U. Edinburgh, Scotland), D. F. Hogg and R. D. E. Rumsey. *Gastroenterology* 56(2):193-199, 1969.

The effect of varying degrees of gastric outflow obstruction produced by ligatures around the duodenum 1 cm from the pylorus, on the weight, surface area, mucosal volume, and total parietal and peptic cell populations of the stomach was examined in male Wistar rats. Animals were sacrificed 11 weeks after obstruction, and the final degree of obstruction was assessed at autopsy and classified: moderate obstruction (10 rats); severe obstruction (3 rats); and ineffective obstruction (5 rats). In the group with moderate obstruction, the mean growth curve was identical to the control group. The mean values for the weight, surface area, mucosal volume of the fundus and antrum, and the total parietal and peptic cell populations were all greater in the obstructed rats than in the controls. No significant differences in the height of the fundic or antral mucosa were noted between the 2 groups. In the group with severe obstruction, the 3 postoperative survivors had to be sacrificed at 3-5 weeks due to severe wasting. All 3 had multiple gastric ulcers and marked hyperplasia of the gastric mucosa. Increases in the weight of the whole stomach and the parietal and peptic cell populations were due to inflammatory edema and, as in the group with moderate obstruction, to an increase in the surface area. In the group with ineffective obstruction, no differences were found as compared to controls. These results indicate that obstruction to gastric outflow causes a marked hyperplasia of the gastric mucosa in the rat, with an increase in the surface area of the stomach producing an increase in the mucosal volume; the increase in the total populations of the parietal and peptic cells is caused by an increase in the actual number of the gastric glands.

1310 PYLORIC STENOSIS IN HAWAII: A 25-YEAR SURVEY OF 276 CASES. I. CLINICAL ASPECTS. *(E.)* Shim, W. K. T. (Kauikeolani Children's Hosp., Honolulu, Hawaii), A. Campbell and S. Wright. *Hawaii Med J* 28(3):201-204, 1969.

The clinical data, including sex, tumor palpability, gastric waves roentgen signs, age at operation, complications and mortality, on 276 patients operated on for pyloric stenosis over a 25-yr period (1942-1966) in Hawaii were studied in order to evaluate the management of this disease. A male:female ratio of 5:1 was noted (similar to other series). A palpable tumor was present in 170 cases (65%), and a questionable mass was present in 15 cases. X-ray studies were diagnostic in 133 of 191 cases studied (70%), and were considered not diagnostic in 58 (30%). Barium studies were performed in 74% of the cases without palpable masses and in 71% of cases with palpable masses, indicating that roentgen studies were often obtained unnecessarily. The modal age at surgery was 5 weeks for 259 full-term infants and 7 weeks for 7 premature infants. The average birth weight was 7.34 pounds as compared to 7.03 pounds in normal infants. Fredet-Ramstedt pyloromyotomies were performed on 275 patients and 1 patient had an exploratory duodenotomy; 4 patients had multiple procedures. There were 4 postoperative deaths (1.45%). Complications included mucosal perforations in 66 cases (29%), infections in 18 cases (6.5%), and postoperative vomiting in 61 of 212 cases (29%). The frequency of operative mucosal perforations and infections in this study was higher than for other published studies, but the operative mortality was the same.

1311 IMMUNOLOGICAL STUDIES OF CANCER OF THE STOMACH IN JAPANESE. I. IMMUNOCHEMICAL CHARACTERIZATION OF NUCLEOPROTEINS OF STOMACH CANCER. *(E.)* Yamamoto, T. (U. Hawaii Sch. Med., Honolulu), M. Yokoyama, A. E. Gal, N. V. Bhagavan and T. Kasugai. *Hawaii Med J* 28(3):213-217, 1969.

The antigenic differences in the nuclear material (deoxyribonucleoprotein) isolated from gastric tissues with (10 cases) and without (6 cases) neoplasm were investigated by immunochemical analysis using the specific antibody produced by the immunization of rabbits with this material. When tested with anticancer nucleoprotein serum, nucleoproteins from cancer tissue demonstrated additional antigenic properties not found in normal tissues. Conversely, cancer nucleoproteins lacked an antigenic component present in normal gastric tissues as demonstrated with anti-noncancer nucleoprotein serum. Treatment of the nucleoproteins by heating at 56C for 30 min or incubating with protease and DNAase at 27C for 48 hr abolished these differences. Further experiments demonstrated that the sera of 11 of 21 patients with gastric cancer contained an antibody to nucleoprotein isolated only from cancerous gastric tissues. Two additional patients' sera gave positive precipitin reactions with normal as well as with cancer nucleoproteins. The results indicate the possible existence of a specific nucleoprotein in sera from cancer patients.

1312 THE RISK OF CARCINOMA IN THE RESECTED STOMACH. *(Ger.)* Hilbe, G. (Surg. Clin., U. Innsbruck, Austria), G. M. Salzer, H. Hussl and H. Kutschera. *Langenbeck Arch Klin Chir* 323(2):142-153, 1968.

Between 1945 and 1964, 5.4% of 9,857 autopsied patients had confirmed gastric carcinomas and 33 (8.2%) of 404 with stomach resections dating back 5 yr or more had confirmed gastric carcinomas. Suspected gastric carcinoma was found in 8 more patients who had undergone gastrectomy. Thus, the incidence of gastric carcinomas is significantly higher among subjects with previous gastrectomies. The average time between gastric resection and autopsy was 22.8 yr in subjects with gastric carcinomas and 19.1 yr in those without carcinomas. There was not enough data to show the effect of the resection procedure on the incidence of gastric carcinomas.

1313 CHANGES IN CALCIUM METABOLISM AFTER GASTRIC RESECTIONS FOR PEPTIC ULCER.

(It.) Giampaglia, F. (Inst. Gen. Surg. Clin., U. Naples, Italy), F. Leone, G. Cinque and R. Sorrentino. *Rass Int Clin Ter* 48(21):1330-1337, 1968.

Blood and urinary Ca and P levels and alkaline phosphatase activities were determined on 30 male patients, aged 23-62 yr, who had undergone Billroth II gastrectomies for peptic ulcers 2-10 yr before. Patients with liver and kidney diseases were excluded. Disturbances in Ca metabolism were seen in 14 patients: 8 had hypercalcemia and 6 had hypocalcemia. Blood phosphorus levels were reduced in 12 cases and increased in 1. Urinary Ca and P levels were reduced in most patients, and alkaline phosphatase activities were within normal limits but tended to be low. Vague lumbar pains were present in 7 of the 15 patients who had undergone gastrectomies 5-10 yr before, 4 had an increased tendency to develop caries, and 5 had radiological signs of osteroporosis in the pelvis and lumbar spine. Bone changes did not develop in patients who followed their diets closely and drank 150-200 ml of milk/day.

1314 A STUDY OF THE PATHOGENESIS OF THE DUMPING SYNDROME.

(Rus.) Sveshnikov, A. I. (Cent. Inst. Postgrad. Med., Moscow, USSR). *Khirurgiia (Moskva)* 44(12):39-44, 1968.

Studies of the autonomic and central nervous systems, gastrointestinal transit, clinical symptomatology and the cardiovascular response to a test meal were carried out in 132 patients (98 men and 34 women) subjected to gastroduodenal surgery for peptic ulcers (93 cases), gastric cancer (20 cases), gastric polyps (18 cases) or duodenal diverticulum (1 case); 82 of these patients had dumping (37 mild, 31 moderate and 14 severe). In patients with moderate or severe dumping, autonomic vascular disturbance such as periodic precordial pain, tachycardia, shortness of breath, facial flushing and a feeling of fever and increased perspiration were common, and many complained of headaches, dizziness and marked weakness. Patients with severe dumping showed a high incidence of emotional and psychological abnormalities (neurotic reactions, moodiness, apathy and depression). When the gastrointestinal transit was compared radiologically in 43 postgastrectomy patients (21 with dumping and 22 without), it was essentially normal in 18 of the 2nd group but was very rapid (both into and out of the small intestine) in most of those with dumping. The cardiovascular response (cardiac output, circulating blood volume, electrocardiogram and serum electrolyte levels) to 150 ml of 50% glucose was compared in postgastrectomy patients with and without dumping, as well as in normal controls, using radioactive krypton and chromium-labeled erythrocytes. The onset of dumping was accompanied by a drop in circulating blood volume and erythrocytes (by an average of 1064 ml and 322 ml, resp.), a drop in cardiac output, electrocardiographic changes (tachycardia, depression of the T wave, shortening of the S-T interval and appearance of a U wave), a moderate decrease in serum potassium, an increase in serum sodium, and a marked decrease in coronary blood flow (from 418 to 203 ml/min in severe dumping). It is concluded that the coronary spasm and other hemodynamid disturbances accompanying the dumping syndrome are due largely to autonomic dystonia and hypermotility of the small intestine and gastric stump.

1315 ULTRASTRUCTURE OF THE HUMAN GASTRIC MUCOSA IN NORMAL SUBJECTS AND PATIENTS WITH CHRONIC GASTRITIS.

(Sp.) Laguens, R. (Fac. Med., U. La Plata, Argentina) and J. C. Meeroff. *Rev Esp Enferm Apar Dig* 27(8):1133-1146, 1968.

Serial gastric biopsies (Debray punch technique) were taken from 50 patients who were also subjected to careful clinical, radiological and endoscopic examination and studies of gastric secretion. All biopsies were taken under fluoroscopic control from the same site in the gastric mucosa. In 30 cases (including 10 normal subjects), biopsies were taken both under basal conditions and after maximal Histalog or Peptavlon stimulation; the 20 remaining patients all had chronic gastritis. A detailed description is given of the normal oxyntic cells, pavement cells, parietal cells, chief cells, mucous cells, argentaffin cells, stroma and basal membrane. Following stimulation with Histalog or Peptavlon, marked changes were seen in the oxyntic cells (decreases in mitochondrial density and in the smooth endoplasmic reticulum, with an increased number of plasma-membrane invaginations) and slight changes developed in the chief cells. In patients with chronic gastritis, the most important changes were seen in the stroma and the elements making up the inflammatory exudate (plasmoblasts), followed by moderate changes in the oxyntic and chief cells. In general, the results of electron microscopy paralleled those previously obtained with the light microscope. However, the finding that the inflammatory exudate consists of plasmoblasts implies that immunological mechanisms probably play a role in the pathogenesis of gastritis.

1316 GASTRIC SECRETION AND EMPTYING BEFORE AND AFTER VAGOTOMY AND PYLOROPLASTY, WITH AND WITHOUT CONTINUOUS INFUSION OF PEPTAVLON PENTAGASTRIN.

(E.) Aylett, P. (Westminster Hosp., London, England), C. Wastell and I. Wise. *Amer J Dig Dis* 14(4):245-252, 1969.

The effects of pentagastrin in the form of Peptavlon on gastric acid secretion and gastric emptying were studied in 14 male patients submitted to 2 Hunt quantitative test meals before, and 2 after, selective vagotomy and Finney pyloroplasty. The test meals were paired, one being a control meal and the other being given during a continuous infusion of pentagastrin (6 μg/kg/hr i.v.). Pentagastrin markedly increased acid output over the control level both before and after vagotomy, and the response before operation was greater than that reported by some other workers. There was a significant, but not major, reduction in response to pentagastrin following vagotomy, and control secretion was reduced 36% by vagotomy. Pentagastrin did not appear to affect the rate of gastric emptying. However, vagotomy and pyloroplasty resulted in increased gastric emptying after both the control and pentagastrin meals.

1317 COMPLICATIONS OCCURRING DURING AND AFTER STOMACH SURGERY. *(Ger.)* Peiper, H. J. (Surg. Clin., U. Cologne, Germany). *Langenbeck Arch Klin Chir* 322(Kongressber.):157-171, 1968.

An analysis was made of complications occurring during and after 4295 gastrectomies for peptic ulcers. The Billroth II gastrectomy, with either retrocolonic or antecolonic gastroenterostomies and usually without Braun's anastomosis, was the procedure most frequently employed. The total operative mortality was 5% and that for emergency surgery was 23% because of bleeding and perforations occurring in older patients. For this reason it is recommended that resections be combined with vagotomy and pyloroplasty in older patients. The most common causes of death were generalized complications such as pneumonia, cardiac insufficiency, pulmonary embolisms, etc. Fatal localized complications included insufficiency of the duodenal stump and anastomoses, severe atonia, biliary tract trauma, pancreatic necrosis, and bleeding. Complications occurred during surgery in 2.35% of these operations, and 28.7% of these complications were fatal. They consisted mainly of trauma to the pancreatic parenchyma, cystic and hepatic ducts, the splenic and middle colic arteries, and the gastric and colonic walls.

1318 THE SURGICAL TREATMENT OF POSTPRANDIAL AND NUTRITIONAL SYNDROMES DEVELOPING AFTER GASTRECTOMIES. *(It.)* Grassi, G. (San Giovanni Hosp., Rome, Italy). pp. 523-578 in: Reinterventi in Chirurgia Gastro-Intestinale (Reoperations in gastrointestinal surgery), Rome, E. M. E. S., 1968.

Reconstructive surgery was performed on 14 patients (12 men and 2 women, aged 30-67 yr) who had undergone gastrectomies All of these patients had dumping syndrome, 8 had vomiting and regurgitation of bile, 9 had pain, and 2 had diarrhea. Nutritional disorders included weight loss in 14, iron deficiency in 2, anemia in 7, low blood calcium levels in 2, low serum protein levels in 4, and low serum albumin levels in 1. Associated disorders included bleeding in 10, gastrojejunitis in 6, polypoid hypertrophy of the duodenal stump in 3, recurrent ulcers in 2, cholecystitis in 2, and 1 case each of gastritis, recurrent pancreatitis, cholelithiasis, and choledocholithiasis. All of these patients had gastrojejunostomies which were reconstructed by variants of the method of Henley, Soupault, and Bucaille in which an isoperistaltic jejunal loop is placed between the gastric stump and the duodenum. In 12 cases this was done by transposing the efferent loop and in 2 cases by interposing a free loop. There were no operative deaths. Only 1 patient developed an acute pancreatic disorder after surgery, and this rapidly responded to conservative treatment. Results were excellent in 9 cases and good in 5.

1319 COOLING TREATMENT OF GASTRIC BLEEDING. *(Ger.)* Blixenkrone-Moller, N. (Community Hosp., U. Aarhus, Denmark). *Z Ges Inn Med* 23(23):764-765, 1968.

In experiments performed on dogs, cooling of the stomach to -15 to -20C with alcohol did not reduce secretion of acid by the stomach. About 50% of these dogs developed ulcers in the lesser curvature of the stomach. Edema, hyperemia, and a few small erosions, but no deep ulcerations, were observed after cooling to +6 to +8C. After 4 days all these changes had disappeared. This latter method was then modified to control hematemesis or melena in human patients with peptic ulcers or erosive gastritis. Two complications developed: a rupture of the stomach in one case and recurrent bleeding and a newly formed ulcer in the other. ECG changes consisting of flattening or inversion of T-waves in the 1st and 2nd standard leads appeared in about 1/3 of the patients. These changes disappeared 2-3 days after cooling treatment was discontinued. It is recommended that the capacity of the balloon containing alcohol solutions should not exceed 600 ml to prevent stomach rupture in older patients with gastric atrophy, that cooling treatment should be discontinued after 24 hr to prevent development of new ulcers, and that cooling treatment should be avoided in patients with signs of myocardial damage.

1320 STUDY OF 333 CASES OF STOMACH CANCER. *(Fr.)* Tschanta, P. (Surg. Clin., U. Geneva, Switzerland) and M. Weber. *Schweiz Med Wschr* 99(1):10-17, 1969.

A study was made of 333 patients with stomach cancer (204 men and 129 women with a mean age of 63 yr) who were hospitalized during a 10-yr period. Acute bleeding, loss of appetite, and phlebitis were rarer than among most groups of such patients. Palpable tumors were found in 52 cases, and only 18 of these were operable. Perforations occurred in 8 cases. Associated diseases included 2 cases of pernicious anemia, 39 of peptic ulcers, and 3 degenerated adenomas. The location of the tumor, determined in 305 cases, was most frequently the pylorus (43.3%) followed by the vertical part of the lesser curvature (17.4%) and the sides of the greater curvature (6.7%). The entire stomach was involved in 12.2%. Altogether, 83 patients with a mean age of 71.3 yr were inoperable. Among the palliative procedures performed on these 83 patients, only esophagogastric or esophagojejunal anastomoses for dysphagia or pyloric stenosis prolonged survival. Hofmeister-Finsterer gastrectomies were performed on 67 patients and Péan gastrectomies on 32. Three patients died after the former procedure and 3 after the latter. Two of the 3 fatalities occurring after Péan gastrectomies were due to rupture of the anastomosis. The 3rd patient died of cerebromalacia, but autopsy showed a fistula which formed after partial rupture of the anastomosis. Partial proximal gastrectomies, performed in 30 cases, resulted in 6 deaths. These included 3 caused by rupture of the anastomosis and 3 due to other causes. Total gastrectomies were performed in 36 cases. Of the 8 who died, 2 had afferent-loop volvulus, 2 had ruptured anastomoses, and 1 had intestinal infarction, pulmonary embolisms, and a myocardial infarct. Long-term follow-up of 65 patients who underwent curative surgery showed that 10 survived for 5 yr or more.

1321 A STUDY OF THE RELATION BETWEEN MULTIPLE GASTRIC ULCERS AND ULCER-CANCER. *(Jap.)* Sano, R. (Natl. Cancer Ctr. Inst., Tokyo, Japan). *Iryo* 22(11):1219-1224, 1968.

The relation between multiple gastric ulcers and ulcer-cancer was investigated by a study of 260 and 140 surgical patients, resp., with benign and malignant ulcers. Multiple lesions were found in 30% and 22% of the 2 groups; this difference was not statistically significant. However, patients with more than 3 ulcers (benign or malignant) tended to be younger than those with 1 or 2. In both benign and malignant multiple ulcers, the most common sites were the lesser curvature, pylorus, body and "kissing ulcers" in descending order. The depth of the gastric wall defect determined whether the ulcer was considered deep (penetrating) or shallow (limited to the muscularis mucosae). In both benign and maligant cases, although deep single ulcers were more frequent than shallow ones, shallow multiple ulcers were more common than deep ones.

1322 VOMITING DUE TO ORGANIC ANOMALIES OF THE STOMACH AND DUODENUM IN INFANTS (WITH THE EXCEPTION OF ANOMALIES OF THE CARDIA AND DUODENAL BULB). *(Fr.)* Grenet, P. (Herold Hosp., Paris, France), J. Valayer and J. Badoual. *Rev Prat* 19(1):27-44, 1969.

1323 LYMPHOSARCOMA OF THE STOMACH. *(It.)* Rigattieri, P. (Eretenia Nursing Home, Vicenza, Italy). *Chir Gastroent* 2(4):449-458, 1968.

1324 CARCINOMA OF THE GASTRIC STUMP AFTER PARTIAL GASTRECTOMY FOR PEPTIC ULCERS. *(Pol.)* Reśliński, B. (Med. Acad., Poznan, Poland) and W. Wiktorowicz. *Pol Przegl Chir* 50(1):28-33, 1969.

1325 DIAGNOSTIC DIFFICULTIES IN MENETRIER'S DISEASE. *(Pol.)* Dzoga, M. (Acad. Med., Gdansk, Poland), K. Lewicki and J. Kossak. *Pol Przegl Chir* 50(1):65-67, 1969.

1326 WATER AND ELECTROLYTE DISTURBANCES IN PYLORIC STENOSIS AND THEIR TREATMENT. *(Rum.)* Dolinescu, C. (Inst. Med. Pharm., Iasi, Romania), C. Lazar, M. Chifan and M. Diaconescu. *Rev Medicochir Iasi* 72(3):661-669, 1968.

1327 THE STOMACH IN IRON-DEFICIENCY ANEMIA. *(E.)* Shearman, D. J. C. (Royal Infirm., Edinburgh, Scotland) and N. D. C. Finlayson. *Gut* 9(6):722-723, 1968.

1328 THE ANATOMY OF THE "DUMPING SYNDROME". *(E.)* Fitzgerald, P. (Dept. Anat., U. Coll., Cork, Ireland). *Irish J Med Sci* 1(10):471-473, 1968.

1329 RERESECTION FOR GASTRIC CARCINOMA. *(E.)* Scheinin, T. M. (Dept. Surg., U. Turku, Finland), M. V. Inberg and M. I. Linna. *Acta Chir Scand* 134(8):660-666, 1968.

1330 THE CHEMOTHERAPY OF ADVANCED GASTRIC CANCER USING 5-FLUOROURACIL. *(It.)* Boffi, L. (Santa Maria Nuova Hosp., Florence, Italy), P. Favi and F. Sbaragli. *Osped Ital Chir* 19(2):119-122, 1968.

1331 TRANSFORMATION OF GASTROJEJUNAL ANASTOMOSES INTO GASTRODUODENAL ANASTOMOSES BY MEANS OF ANTECOLONIC AND TRANSMESOCOLONIC END-TO-SIDE GASTROJEJUNOSTOMY IN DOGS WITH STOMACH RESECTIONS. *(It.)* Guerra, L. (Inst. Gen. Surg. Clin., U. Genoa, Italy), P. Salvadè and C. Mel. *Rass Arch Chir* 6(4):276-293, 1968.

1332 RUPTURED LEIOMYOSARCOMA OF THE STOMACH WITH INTRAPERITONEAL HEMORRHAGE. *(E.)* Haeussner, C. F. (Harrisburg, Pa.). *Polyclin Hosp J* [Winter Issue]:21-26, 1968-69.

1333 RETROGRADE GASTROESOPHAGEAL MUCOSAL PROLAPSE: SOLE MANIFESTATION OF STOMACH CARCINOMA. [CASE REPORT] *(E.)* Dietz, M. W. (Burge-Protestant Hosp., Springfield, Mo.). *Missouri Med* 66(3):200-203, 1969.

1334 GASTRIC INFECTIONS CAUSED BY THE YEAST-LIKE FUNGI. *(Sw.)* Schonebeck, J. (Norrköping Hosp., Sweden). *Nord Med* 80(50):1691-1694, 1968.

1335 PALLIATIVE SURGERY FOR INOPERABLE STOMACH CANCER. *(Por.)* Branco Ribeiro, E. (São Lucas Sanat., São Paulo, Brazil). *Bol Sanat S Lucas* 30(3):77-78, 1968.

1336 TYPES OF GASTRIC SECRETION IN PATIENTS WITH PEPTIC ULCERS, CHRONIC GASTRITIS, GASTRIC POLYPS AND STOMACH CANCER. *(Rus.)* Mamonova, N. V. (Moscow Sci.-Res. Inst. Roentgenol. Radiol., Min. Hlth. RSFSR). *Sovet Med* 31(12):124-126, 1968.

1337 METOCLOPRAMIDE IN THE IMMEDIATE AND DELAYED DISTURBANCES FOLLOWING VAGOTOMY AND GASTRIC RESECTION. *(It.)* Grassi, G., C. Orecchia and I. Cantarelli. *Chir Gastroent* 2(4):498-505, 1968.

1338 COPPER AND COBALT CONTENT OF BIOLOGICAL FLUIDS IN PATIENTS WITH DUMPING SYNDROME. *(Rus.)* Bekturdiiev, Kh. B. (Tashkent Med. Inst., USSR) and K. Iu. Iuldashev. *Vop Pitan* 27(5):44-46, 1968.

1339 RECONSTRUCTIVE GASTRECTOMIES. *(Rus.)* Chuikov, A. I. (Nikolaev Munic. Hosp. No. 3, USSR). *Vestn Khir Grekov* 100(10):8-11, 1968.

1340 DIRECT GASTRODUODENAL ANASTOMOSIS IN THE TREATMENT OF CERTAIN CONDITIONS OF THE OPERATED STOMACH. *(E.)* Bidulescu, A. (Hosp. No. 1, Ploiesti, Romania), I. Tigănus, C. Popovici and I. Bidulescu. *Romanian Med Rev* 12(3):55-61, 1968.

1341 GASTRODUODENAL (PYLORIC) BAND: ENDOSCOPIC FINDINGS AND FIRST REPORTED CASE. *(E.)* Smith, V. M. (Mercy Hosp., Baltimore, Md.) and K. W. Tuttle. *Gastroenterology* 56(2):331-336, 1969.

1342 NET ION FLUX AND HISTOPATHOLOGIC CHANGES INDUCED BY ACUTE GASTRIC DILATATION: STUDIES ON AN *IN VIVO* MODEL. *(E.)* Bulkley, G. (Harvard Med. Sch., Boston, Mass.), H. Goldman, J. Noe and W. Silen. *Surg Forum* 19:290-292, 1968.

1343 GASTRIC TUBERCULOSIS. *(E.)* Kossick, P. (Cape Town, S. Africa). *S Afr Med J* 43(1):18-20, 1969.

1344 EFFECT OF WHOLE-BODY X-IRRADIATION ON THE MICROSCOPIC AND SUBMICROSCOPIC STRUCTURE OF THE STOMACH. *(Uk.)* Tkachenko, Z. Ia. (A. A. Bogomolets Inst. Physiol., Acad. Sci. Ukr. SSR, Kiev, USSR). *Fiziol Zh (Kiev)* 14(6):810-811, 1968.

1345 THE PROBLEM OF THE TYPE OF GASTRO-ENTEROSTOMY FOLLOWING BILLROTH II GASTRECTOMY. *(Ger.)* Staffen, A. (Solothurn Cantonal Hosp., Olten, Switzerland). *Wien Med Wschr* 118(47):1019-1021, 1968.

1346 GASTRIC LEIOMYOMA. *(Fr.)* Dony, A., M. Deschreyer and P. Coupatez. *J Belg Radiol* 52(1): 42-43, 1969.

1347 DUODENAL STUMP BLOW-OUT IN THE BILLROTH II GASTRIC RESECTION. *(E.)* Zivic, E. J. (Pittsburgh, Pa.). *J Nat Med Ass* 61(1):17-19, 1969.

1348 GASTRIC MUCOSAL LACERATIONS AFTER CARDIAC RESUSCITATION. *(E.)* Anthony, P. P. (Cent. Middlesex Hosp., London, England) and A. E. Tattersfield. *Brit Heart J* 31(1):72-75, 1969.

See also: 1096,1193,1194,1204,1216,1228,1238,1250,1256,1262,1267, 1270,1282,1294,1387,1397,1422,1424,1686,1705

SMALL INTESTINE

1349 SOME ASPECTS OF THE INFLAMMATION OF THE ILEOCAECAL REGION WITH SPECIAL REFERENCE TO *YERSINIA ENTEROCOLITICA*. *(E.)*

Sjöström, B. (Inst. Clin. Bacteriol., U. Lund, Malmö, Sweden) and B. Niléhn. *Bull Soc Int Chir* 27(5):386-392, 1968.

The incidence of *Yersinia enterocolitica* was investigated in patients with acute abdominal pain suggestive of acute appendicitis. Positive cultures were obtained from the contents of the appendix in 22 of 581 appendectomized subjects (3.8%) and in the feces of 16 of 284 patients (5.6%) admitted to the clinic because of right lower quadrant pain, but not operated on. The bacterium was also isolated from 1 of 974 controls (283 gynecologic surgery cases, 104 children hospitalized for head trauma, 457 healthy children and 133 healthy adults). Positive cultures were found in 8 of 10 patients with terminal ileitis. Four patients who had follow-up serologic studies showed rising agglutinin titers within 1-2 mo. These results indicate that *Y. enterocolitica* may be a cause of acute abdominal disease, especially of acute terminal ileitis and sometimes of conditions with appendicitis-like symptoms. However, the microorganism seems to play no significant role in the etiology of acute appendicitis.

1350 LOCALIZED NONSPECIFIC ULCERATION OF THE SMALL INTESTINE. *(E.)*

Carlson, H. C. (Mayo Clin., Rochester, Minn.). *Radiol Clin N Amer* 7(1):97-103, 1969.

The clinico-pathologic and roentgenographic features of nonspecific ulceration of the small intestine are described in 32 patients. These ulcers are somewhat more common in males than in females, and are widely distributed throughout the adult age range. Signs of intestinal obstruction were present in 2/3 and severe hemorrhage occurred in about 1/3 of the cases. The lesions, usually solitary, were most common in the ileum (2/3 of the cases), with about 1/3 in the jejunum. They varied in size (from a few mm to a few cm in diameter) and shape (round, oval, linear) and usually involved the mucosa and submucosa; 1/6 of the lesions affected all layers of the small intestine, with resultant perforation and peritonitis. In almost all cases narrowing of the lumen due to fibrosis was associated with the lesions, and as a result of this, the bowel lumen just proximal to the ulcer was dilated, often with muscular hypertrophy. Vascular thrombi occurred in the mesenteric vessels adjacent to the lesion in about 1/6 of the patients. In 4 of the 32 cases, plain abdominal films without contrast medium revealed convincing evidence of high-grade mechanical obstruction of the small intestine. Barium enema examinations were negative in 9 and abnormal in 17 of 26 patients. The ulceration was visualized in 7 of these 17, being diagnosed roentgenologically as stricture (3 cases), annular carcinoma (2), or ulcer crater probably associated with malignant lymphoma (1); the actual ulcer crater, diagnosed as a Meckel's diverticulum, was visualized in only 1 case. In the remaining 10 patients the small intestine revealed dilated loops indicative of mechanical obstruction (7 cases) and grossly abnormal mucosal patterns suggestive of diffuse disease of the small intestine (3). Eighteen patients in this series had clinical evidence of occlusive disease in the heart, brain, or limbs, were receiving antihypertensive medication (usually thiazide diuretics or enteric-coated potassium salts), or had vascular disease recognized in the resected specimen. Ishcemia caused by vascular occlusion could cause focal necrotic lesions such as these nonspecific ulcers. The pathogenetic mechanism was obscure in the other 14 patients.

1351 PATHOLOGY AND PATHOPHYSIOLOGY OF THE SMALL INTESTINE IN MURINE SCHISTOSOMIASIS MANSONI, INCLUDING A REVIEW OF THE LITERATURE. *(E.)*

Domingo, E. O. (Case Western Res. U. Sch. Med., Cleveland, Ohio) and K. S. Warren. *Gastroenterology* 56(2):231-240, 1969.

Pathophysiologic studies were conducted on Swiss albino female mice 20 weeks after s.c. injection of 22 cercariae of a Puerto Rican strain of *Schistosoma mansoni*. At this chronic stable phase of schistosomiasis, the infection was relatively mild and, except for moderate hepatosplenomegaly and portal hypertension, the animals appeared healthy. However, marked pathologic changes were found in the entire small intestine; the intestinal wall was thickened and friable and weighed about 20-30% more than normal. Eggs with and without fibrotic and granulomatous lesions around them were scattered throughout all tissue layers from the pylorus to the ileocecal junction. The mucosa and epithelium of the villi appeared relatively unaffected by the disease process. Hypertrophy and hyperplasia of some lymph nodules was observed. *In vivo* perfusion of the whole small intestine with D-glucose-^{14}C (0.1-2.0 g/100 ml), L-methionine-methyl-^{14}C (0.2-2.0 g/100 ml) and sodium propionate-1-^{14}C (0.025-0.175 g/100 ml) demonstrated little significant difference between infected and uninfected mice in the rates of absorption. Apparent absorption rates increased as the substrate concentration in the perfusion solutions increased until a maximum was reached. The few observations of significantly lower absorption in infected animals occurred at maximal absorption rates.

1352 REPAIR OF DUODENAL WALL DEFECTS: AN EXPERIMENTAL STUDY IN DOGS. *(E.)*

Evans, W. E. (Marquette Sch. Med., Milwaukee, Wis.). *J Trauma* 9(2):172-174, 1969.

In 24 adult mongrel dogs, full-thickness pedicle grafts of distal ileum were used to repair surgically created defects (3 cm x 5 cm) in the anterolateral wall of the duodenum. Animals were divided into 2 groups: in group I the segment was placed in a peristaltic position and in group II the segment was placed in an antiperistaltic position. Feeding was begun the day following surgery. Two animals from each group had upper gastrointestinal series performed at 2, 3, and 4 weeks after surgery, and animals were sacrificed 1-12 weeks after surgery. X-ray studies were normal in all animals studied, and in 23 of the 24 animals there was no evidence of obstruction, disruption, ulcer formation, or decrease in the size of the duodenal lumen from patch shrinkage. In only 1 dog, sacrificed at 2 weeks, was there evidence of duodenal obstruction and ulcer formation within the patch, and the obstruction in this case was attributed to the reaction around a sponge inadvertently left behind at surgery. No differences were noted between the 2 groups with oppositely oriented pedicles. Pedicle grafts of the distal ileum function well in bridging defects of the duodenal wall.

1353 ABSORPTIVE FUNCTION IN CANINE JEJUNAL AUTOGRAFTS AND ALLOGRAFTS. *(E.)*

Cohen, W. B. (Albert Einstein Coll. Med., Bronx, N. Y.), M. A. Hardy, J. Quint and D. State. *Surgery* 65(3):440-446, 1969.

Segmental jejunal autografts were created in 5 (group I) and segmental jejunal allografts were created in 9 (group II) of 14 adult mongrel dogs, using a 6-inch segment of proximal jejunum resected and closed at 1 end and relocated in a subcutaneous tunnel in the neck, bringing the open end through the skin as a mucous fistula. Circulation to the graft was reestablished by anastomosis of the intact vascular pedicle artery and vein to the carotid artery and jugular vein, resp. Absorption studies were performed by instillation of 10 mC of ^{14}C-D-glucose and ^{14}C-D-arabinose (autografts only) into the stoma followed by sampling of peripheral blood for up to 90 min. Graft stomas are closely observed and serial punch biopsies were obtained. In group I, the graft stomas remained healthy for the 2-month study period; biopsy revealed normal mucosal histology. Absorption studies revealed active transport of D-glucose and passive absorption of D-arabinose. In group II, the mean survival time of the allograft by gross appearance of the stoma was 8 days. The earliest microscopic signs of rejection occurred at a mean of 5.6 days. Cessation of active transport of D-glucose occurred at a mean of 6.5 days, concomitantly with late histological rejection. Therefore, loss of active transport of ^{14}C-D-glucose by intestinal allografts is a useful index of impending rejection of the allograft which may be of clinical value.

1354 **PRODUCTION OF ARTIFICIAL SPHINCTERS OF THE GASTROINTESTINAL TRACT BY ABLATION OF THE LONGITUDINAL MUSCLE LAYER OF THE INTESTINE.** *(E.)* Schiller, W. R., L. J. A. DiDio, T. Q. Winter, J. C. Mall and M. C. Anderson. *Bull Soc Int Chir* 27(5): 449-455, 1968.

Circumferential removal of 1-cm segments of longitudinal muscle produced a short segment of small intestine with sphincter-like action that appeared to be effective in slowing intestinal transit. In dogs with 90% resection of the distal small intestine and 2 of the artificial "sphincters" (2-4 inches proximal to the jejuno-ileal anastomosis), weight loss averaged 29% in the mean survival time of 73 days. Two of 6 dogs survived more than 180 days in contrast, control animals with 90% resection experienced 38% weight loss in the average survival time of 38 days with 0 of 6 dogs surviving more than 112 days. Isoperistaltic segments (3-4 inches) constructed in the remaining distal jejunum gave results similar to those in controls, whereas interpolation of antiperistaltic jejunal segments reduced the average weight loss to 25% and tended to increase survival in some animals: 1 animal lived more than 150 days and the average survival time was 39 days, but there was a high incidence of complications, including obstruction and anastomotic disruption. Dogs survived indefinitely after 75% distal bowel resection with moderate weight loss (average 17%). This was not affected by construction of iso- or antiperistaltic segments. Three dogs with artificial sphincters survived with an average weight loss of only 9%. Microscopic studies confirmed that the longitudinal muscle and the myenteric plexus were removed by this procedure, resulting in partial denervation. Minimal cicatricial reaction was observed at the site of muscle ablation. Preliminary experiments suggest that animals with a single 4-cm wide sphincter tolerate resection better than those with 4 1-cm sphincters 4-5 cm apart.

1355 **CAUSES OF SMALL INTESTINAL OBSTRUCTION: A STUDY COVERING THE STOCKHOLM AREA.** *(E.)* Räf, L. E. (Serafim Hosp., Karolinska Inst., Stockholm, Sweden). *Acta Chir Scand* 135(1):67-72, 1969.

The causes of nonneoplastic obstruction of the small intestine were reviewed on the basis of 2295 cases treated surgically in the Stockholm area during the period 1954-1965. Peritoneal adhesions accounted for the obstruction in 1477 cases; 64% were women (average age 49 yr). The incidence of this type of ileus increased somewhat during the 12-yr period; 84% had prior laparotomy. In 98 cases (average 72 yr old; mostly females) gallstones caused obstruction. Food obturation occurred in 64 patients (average 54 yr old, predominantly males) following partial gastric resection and in 33 patients (15 men and 18 women, average 57 yr old) without prior gastric resection. In 95 cases the obstruction was caused by inflammatory stenosis due chiefly to the use of enteric-coated potassium chloride (59 cases) or radiation therapy (14 cases). Other causes of small intestinal obstruction were strangulation furrows (23 cases) idiopathic invagination (13 cases), volvulus (12 cases), paralytic intestinal obstruction (46 cases), postoperative intestinal obstruction (216 cases; 70% male), occlusion of the mesenteric vessels (156 cases), inflammation (46 cases), and congenital or acquired anomalies (16 cases).

1356 **A SHUNT OPERATION FOR OBESITY.** *(E.)* Barron, J. (Henry Ford Hosp., Detroit, Mich.), B. Frame and J. R. Bozalis. *Dis Colon Rectum* 12(2):115-119, 1969.

The 30 patients (29 women and 1 man, 17-50 yr old) receiving small intestinal bypass operations for treatment of intractable obesity since 1963 have now been followed up for 1-5.5 yr. Preoperative weights ranged from 225-360 pounds, with an average of 262 pounds. The duration of obesity ranged from 5-20 yr, and in most cases it began in childhood. A psychiatric consultation and examination was obtained for every patient, and all had tried conventional methods for weight control. Three types of procedures were performed: jejunocolostomy, 21 patients; jejunocecostomy, 2 patients; and jejunoileostomy, 7 patients. In 4 jejunocolostomy patients, internal hernias developed; in 2 there was an intussusception of the proximal end of the closed distal portion of the jejunum into the jejunum. There was no evidence of internal herniation or intussusception until the patient had lost a great deal of weight, and the complications are ascribed to increased mobility of the small intestine resulting from loss of fat. Significant weight loss occurred in all patients. In the jejunocolostomy group, there was an average weight loss of 100 pounds during the 1st yr. In the jejunoileostomy group, there was an average weight loss of 86 pounds during the 1st yr. There was a gradual leveling off of weight loss during the 12-18 month period. The least amount of weight loss was 50 pounds in 1 patient who underwent jejunoileostomy. Significant elevation of BSP retention was noted in most patients at 4-8 months, but returned to normal in most after 16 months. Two patients died 6 and 10 months after surgery from liver failure; in each, the liver had been severely damaged prior to surgery. Seriously impaired food intake is an ominous sign, and calls for immediate correction with tube feeding. All patients said they would undergo the procedure again under similar circumstances. The shunt procedure can be performed with reasonable safety, if adequate nutrition is provided for hepatic protection, in properly selecte well-motivated and relatively young patients; it produces remarkable improvements in appearance, emotional outlook, and family relations.

1357 **LIGATION OF THE INTESTINAL LYMPHATICS AND ARTERIOSCLEROSIS (26 MONTHS' EXPERIENCE).** *(Fr.)* Servelle, M. (St. Michel Hosp., Paris, France), F. Rouffilange, J. Andrieux, H. Perrot and J. Soulié. *Sem Hop Paris* 45(9):571-575, 1969.

Based on experimental findings following ligation of the intestinal lymphatics in dogs and chance observations in 4 patients with significant loss of intestinal lymph (chyloduodenal fistula, sclerosis of the intestinal lymphatics, recurrent chyloperitoneum, and exudative enteropathy), all of which indicated that the serum cholesterol and total lipid levels fall sharply after interruption of lymph flow, ligation of the intestinal lymphatics was performed in 106 patients with arteriosclerosis (20-60 yr old, but mostly between 40 and 50), 10 with coronary heart disease but no history of infarction, and 8 with hyperlipidemia. In the first 30 operations the superior mesenteric vessels were ligated, but intestinal lymphography demonstrated that this produced insufficient lymph stasis; subsequently, ligation was therefore performed in front of the left renal vein after administering a fatty meal and dissecting out the duodenojejunal flexure. This was combined with a uni- or bilateral lumbar sympathectomy and (in 10%) a unilateral adrenalectomy. There were no postoperative complications, and initial results were promising. Fat tolerance tests in all patients (hourly determinations of the serum lipids for 5 hr after ingestion of 60 g of butter) indicated a significant decrease in lipid absorption. Serum lipid and cholesterol levles were decreased, and in patients with coronary heart disease the frequency of anginal attacks was greatly reduced. It is concluded that ligation of the intestinal lymphatics should be performed at an early stage in the development of arteriosclerosis, before the appearance of extensive thrombosis.

1358 **CONGENITAL ATRESIA AND STENOSIS OF THE DUODENUM.** [*Rev.*] *(E.)* Fonkalsrud, E. W. (UCLA Sch. Med., Los Angeles, Calif.), A. A. deLorimier and D. M. Hays. *Pediatrics* 43(1):79-83, 1969.

1359 **DUODENAL HEMATOMA.** *(E.)* Neuhauser, E. B. D. (Child. Hosp. Med. Ctr., Boston, Mass.). *Postgrad Med* 45(2):57-59, 1969.

1360 **LEIOMYOSARCOMA IN MECKEL'S DIVERTICULUM.** *(It.)* Brunetti, E. (Inst. Gen. Surg. Clin., U. Rome, Italy) and A. Nemeth. *Chir Gastroent* 2(4): 459-471, 1968.

1361 **MEDICOLEGAL INDEMNIFICATION FOR EXTENSIVE RESECTIONS OF THE SMALL INTESTINE FOLLOWING ABDOMINAL TRAUMA: PROPOSALS FOR A METHOD OF RAPID CALCULATION.** *(Fr.)* Dijon, H. *Sem Med Prof Medicosoc* 45(2):37-38, 1969.

1362 **A CONGENITAL SAC CONTAINING ILEUM. [CASE REPORT]** *(E.)* Lewis, P. E. (Dept. Surg., U. Queensland, Australia). *Aust New Zeal J Surg* 38(2): 139-140, 1968.

1363 **DUODENAL STENOSIS DUE TO MALROTATION.** *(Fr.)* Chapuis, Y., J. Kekeh, J. J. Serres, G. Boury and F. de Paillerets. *Med Afr Noire* 15(11):441-444, 1968.

1364 **DIAGNOSTIC AND THERAPEUTIC PROBLEMS IN DUODENAL CANCER: REPORT ON SIX CASES.** *(Fr.)* Mercadier, M. (La Pitié Hosp., Paris, France), D. Mellière and J. P. Clot. *Ann Chir* 22(21/22):1231-1238, 1968.

1365 **A CASE OF DUODENAL DUPLICATION.** *(Fr.)* d'Huart, P., S. Bové, P. Kayser, J. Mersch and F. Schwachtsen. *Mem Acad Chir (Paris)* 94(21/22):621-627, 1968.

1366 **ILEUS IN ADULTS.** *(Ger.)* Hillenbrand, H. J. (St. Elisabeth Hosp., Cologne-Hohenlind, Germany). *Chirurg* 40(2):57-61, 1969.

1367 **INFUSION THERAPY IN ILEUS.** *(Ger.)* Schega, W. (Munic. Hosp., Krefeld, Germany). *Chirurg* 40(2):49-53, 1969.

1368 **ILEUS IN INFANTS AND CHILDREN.** (Ger.) *Rosenthal, A. (St. Josef Hosp., Bochum, Germany).* Chirurg 40(2):62-67, 1969.

1369 **MASSIVE HEMORRHAGES FROM THE SMALL INTESTINE.** *(Ger.)* Larena-Avellaneda, A. (Surg. Clin., U. Cologne, Germany) and H. von Brehm. *Chirurg* 40(3):117-120, 1969.

1370 **EFFECTS OF ANTILYMPHOCYTE SERUM ON ABSORPTIVE FUNCTION AND SURVIVAL OF DOG INTESTINAL ALLOGRAFTS.** *(E.)* Quint, J. (Albert Einstein Coll. Med., Bronx, N. Y.), M. A. Hardy and D. State. *Surg Forum* 19:184-186, 1968.

1371 **COMPARISON OF THE PROTECTIVE EFFECTS OF ILEAL RESECTION AND BYPASS IN EXPERIMENTAL ATHEROSCLEROSIS.** *(E.)* Welborn, M. P. (Vanderbilt U. Sch. Med., Nashville, Tenn.), J. E. Wimberly, R. K. Younger, S. E. Stephenson Jr. and H. W. Scott Jr. *Surg Forum* 19:299-301, 1968.

1372 **EFFECTS OF BYPASS OF THE DISTAL THIRD OF THE SMALL INTESTINE ON EXPERIMENTAL HYPERCHOLESTEROLEMIA AND ATHEROSCLEROSIS IN RHESUS MONKEYS.** *(E.)* Shepard, G. H. (Vanderbilt U. Sch. Med., Nashville, Tenn.), J. E. Wimberly, R. K. Younger, S. E. Stephenson Jr. and H. W. Scott Jr. *Surg Forum* 19:302-303, 1968.

1373 **CHOLESTEROL ABSORPTION AFTER REVERSAL OF THE UPPER AND LOWER HALVES OF THE SMALL INTESTINE.** *(E.)* Gebhard, R. L. (U. Minnesota Med. Sch., Minneapolis) and H. Buchwald. *Surg Forum* 19:304-305, 1968.

1374 **CHOLESTEROL EXCRETION IN THE CHRONICALLY BYPASSED ILEUM.** *(E.)* Schwartz, M. Z. (U. Minnesota Med. Sch., Minneapolis), R. B. Moore and H. Buchwald. *Surg Forum* 19:306-307, 1968.

1375 **EFFECT OF HYPERTONIC SOLUTIONS ON INTESTINAL MUCOSAL INTEGRITY.** *(E.)* Fitzgerald, J. F. (New York State U. Downstate Med. Ctr., Brooklyn), P. K. Kottmeier, R. J. Adamson, K. M. Butt, R. A. Hochman and C. Dennis. *Surg Forum* 19:297-299, 1968.

1376 **TRAUMATIC RUPTURE OF THE SECOND SEGMENT OF THE DUODENUM IN A CHILD.** *(Fr.)* Nini, N. *Ann Chir Infant* 9(4):335-337, 1968.

1377 **DUODENAL MESENTERY ARTERY COMPRESSION IN THE ADULT AND SYNDROMES WHICH IMITATE IT.** *(Hun.)* Szabó, L. E. (U. Med. Sci., Budapest, Hungary), S. Karácsonyi and E. Zádory. *Orv Hetil* 109(52): 2875-2879, 1968.

1378 **RADIOLOGICAL AND CLINICAL DIAGNOSIS OF DUODENAL STASIS.** *(Hun.)* Nagy, S. (Ujpest 4th Distr. Counc. Hosp., Hungary) and I. Gal. *Orv Hetil* 109(52):2880-2884, 1968.

1379 **ULTRASTRUCTURAL STUDY OF CENTRAL NERVOUS SYSTEM LESIONS IN WHIPPLE'S DISEASE.** *(Fr.)* de Groodt-Lasseel, M. (Lab. Histol., State U. Ctr., Antwerp, Belgium) and J. J. Martin. *Path Biol (Paris)* 17(3/4):121-131, 1969.

1380 **SARCOMA OF THE SECOND PART OF THE DUODENUM.** *(Fr.)* Deschreyer, M., A. Dony and P. Coupatez. *J Belg Radiol* 52(1):40-41, 1969.

1381 **INVERSION OF A SEGMENT OF THE SMALL INTESTINE IN THE TREATMENT OF SOME KINDS OF CHRONIC DIARRHEA: A CRITICAL STUDY OF TWO PERSONAL CASES.** *(Fr.)* Grenier, J. F. (Surg. Clin. B, I. N. S. E. R. M., Paris, France), G. Sava, M. Gillet, R. Crevoisier and J. Kachelhoffer. *Mem Acad Chir (Paris)* 94(25/26):717-725, 1968.

1382 **ENDOMETRIOSIS, MUCOCELE, AND REGIONAL ENTERITIS OF MECKEL'S DIVERTICULUM AN UNUSUAL CASE REPORT AND EXPERIENCES IN 111 CASES** *(E.)* Won, K. H. (Inst. Path. Res., Harrisburg Hosp., Pa.). *Arch Surg* 98(2):209-212, 1969.

1383 **TRAUMATIC INJURIES TO THE SMALL INTESTINE.** *(E.)* Hall, A. (Fairfax Hosp., Falls Church, Va.) and A. Angles. *Amer Surg* 35(2):130-134, 1969.

1384 **RHABDOMYOSARCOMA OF DUODENUM. [CASE REPORT]** *(E.)* Moses, I. (Kern County Hosp., Bakerfield, Calif.) and E. L. Coodley. *Amer J Gastroent* 51(1):48-54, 1969.

1385 **MASSIVE BLEEDING FROM A DIFFUSE VASCULAR MALFORMATION OF THE SMALL INTESTINE. [CASE REPORT]** *(E.)* Pierce, W. S. (U. Pennsylvania Hosp., Philadelphia) and A. V. Davis. *Arch Surg* 98(3):336-340, 1969.

1386 **A CASE OF JEJUNAL INTUSSUSCEPTION INTO BRAUN'S ANASTOMOSIS.** *(E.)* Takami, T. (Takamatsu Red Cross Hosp., Japan) and T. Fukata. *Arch Jap Chir* 38(1):220-223, 1969.

See also: 1199,1240,1251,1258,1309,1322,1328,1454,1468,1707,1710

1387 **GASTRIC ULCER, DUODENAL ULCER AND GASTRIC CARCINOMA: A CASE-CONTROL STUDY OF CERTAIN SOCIAL AND ENVIRONMENTAL FACTORS.** *(E.)* Gillies, M. (Royal Prince Alfred Hosp., Sydney, Australia) and A. Skyring. *Med J Aust* 2(25):1132-1136, 1968.

In an effort to define some genetic, social or environmental factors of etiological significance, 100 patients with gastric ulcer (52 males, 48 females), 50 with duodenal ulcer (38 males, 12 females) and 25 with gastric carcinoma (17 males, 8 females) and 175 sex- and age-matched controls were interviewed and the responses relating to more than 40 factors were analyzed. When each disease group was compared with its own controls and with the entire study population, no differences were detected for nationality, religion, site of habitation, social rank of suburb, type and hours of work, family size and occupation. Gastric ulcer patients had significantly lower educational attainment and significantly more marital stress and divorce than their controls. In addition, a history of peptic ulcer in parents or siblings, smoking, and regular aspirin ingestion were more frequent among the gastric ulcer patients (in 21, 82 and 57 of 100 cases, resp.) than among their controls (in 5, 56, and 22 of 100 cases, resp.). Aspirin was taken by 23 of 52 men and 34 of 48 women with gastric ulcer, usually as APC powders out of habit or to "settle the nerves". The consumption of non-aspirin-containing drugs, including steroids, phenylbutazone, indomethacin, antibiotics and tranquilizers, was comparable when each disease group was compared with its controls and with the entire population. There was no association between any of the disease groups and the frequency or pattern of alcoholic drinking. Duodenal ulcer and gastric carcinoma patients, in fact, did not differ from each other or from their controls in any of the variables tested.

1388 **PSYCHOLOGICAL FACTORS, OPERATIVE PROCEDURES, AND RESULTS OF SURGERY FOR DUODENAL ULCER.** *(E.)* Glen, A. I. M. (Peptic Ulcer Clin., Western Infirm., Glasgow, Scotland) and A. G. Cox. *Gut* 9(6):667-671, 1968.

Aspects of personality and mood were measured by means of the Eysenck Personality Inventory (forms A and B) and the Minnesota Multiphasic Personality Inventory, and results were correlated with the success of surgery for chronic duodenal ulcer in 39 males treated by Polya partial gastrectomy and 37 treated by total vagotomy with gastrojejunostomy. Based on tests given before and a minimum of 8 yr after surgery, poor results, as measured by severity of alimentary symptoms, were associated with significant personality and mood disorders. No relation was found between clinical success and the type of operation performed, nor between chronicity of the disease and personality. Comparison of the postoperative patients with 63 preoperative male duodenal ulcer patients did not reveal any significant difference in the aspects of personality measured, but comparison of 78 preoperative male and female patients with standard test norms showed that ulcer patients are significantly more neurotic, less extroverted and more depressed than the normal population. Insulin tests of gastric acid secretion performed within 14 days after vagotomy in 66 pretested patients showed that those with a late response had a higher score for neuroticism than those who did not respond. Such physiologic changes associated with neuroticism are probably related to the poor postoperative results noted in patients with abnormal personality.

1389 **REDUCTION OF GASTRIC ULCERATION AND ACID SECRETION BY LOW MOLECULAR WEIGHT DEXTRAN.** *(E.)* Rudick, J. (Mount Sinai Sch. Med., New York, N. Y.), J. Finkelstein, D. A. Dreiling and A. E. Kark. *Surgery* 65(3):470-476, 1969.

The effects of low-molecular-weight dextran (LMWD) on gastric ulceration and gastric secretion were studied in adult male Sprague-Dawley rats and adult mongrel dogs. A marked protective effect of i.v. LMWD on rumen ulceration in pylorus-ligated rats and a marked reduction in acid and pepsin output were noted. By varying the dose of LMWD given, it was found that the dose producing 50% inhibition of acid output was 8.5 mg/100 g body weight, a dose which is 1/20-1/25 that usually recommended for improving tissue blood flow. In dogs, LMWD inhibited Heidenhain pouch-acid output in response to endogenous and exogenous histamine. Acid secretion in response to gastrin (endogenous or exogenous) and Histalog were unaffected by LMWD. It is suggested that the antiulcer effect of LMWD is related to decreased acid output, and that LMWD exerts its effect by interfering with the release and/or action of histamine by forming a complex with it.

1390 **MICROCIRCULATORY AND MAST CELL CHANGES IN RESTRAINT STRESS: ROLE OF GASTRIC ACID.** *(E.)* Guth, P. H. (California Coll. Med., Orange) and X. Kozbur. *Amer J Dig Dis* 14(2):113-117, 1969.

To determine whether the previously observed engorgement of microvessels below the surface epithelium and the decrease in the number of mast cells in the gastric mucosa prior to ulceration of the mucosa in restrained rats are due to the effects of gastric acid irritation, restraint studies were repeated in Wistar rats following the intragastric instillation of sodium bicarbonate (3 ml of a 15% solution). Following 30 min of restraint, there was a statistically significant accumulation of blood and decrease in mast cells in spite of persistently high intraluminal gastric pH (>7.7). Although no ulcers occurred in rats restrained for 30 min, ulcers were noted in 3 of 16 rats (18.7%) restrained for 4 hr; the gastric pH in these 3 animals was 3.4, 3.5, and 7.1. While failing to prevent mucosal microcirculatory and mast cell alterations, neutralization of gastric acid did offer partial protection against stress ulceration. It is concluded that these mucosal changes are not due to a local acid irritation, but, as previously reported, to vagal stimulation and adrenal corticosteroid secretion.

1391 **RECURRENT ULCERS AFTER GASTRECTOMY AND VAGOTOMY.** *(Sp.)* de Miguel, J. *Rev Esp Enferm Apar Dig* 27(10):1443-1454, 1968.

Follow-up studies were made on 232 patients with peptic ulcers who were treated by partial gastrectomy and on 262 who received gastroenterostomies or pyloroplasties and vagotomies. Of patients who had been operated on 5 yr or more before, about 10% developed a recurrent ulcer. This percentage was especially high (20.8%) among those with Billroth I gastrectomies. No recurrences were observed among those with simple stomach ulcers, but 3.5% of those with both stomach and duodenal ulcers did have recurrences. Recurrences were seen in about 5% of those subjected to vagotomies without drainage. There was no evidence that recurrences were more frequent after pyloroplasty than after gastroenterostomy. No recurrences developed in any of the 41 patients with stomach ulcers who had been treated by pyloroplasty and vagotomy with drainage. Many patients with recurrent ulcers responded well to conservative treatment so that surgery was not necessary. So far, gastrectomies with simple vagotomies have been successful in all patients requiring surgical treatment. When recurrent ulcers developed after vagotomies without drainage, the vagotomy was shown to be incomplete.

1392 INDUCTION OF AN EXPERIMENTAL GASTRIC ULCER IN THE RABBIT AFTER SLOWLY DEVELOPING STENOSIS OF THE COMMON BILE DUCT.

(It.) Mattioli, F. (Inst. Gen. Surg. Clin., U. Genoa, Italy) and G. C. Torre. *Gaz Int Med Chir* 74(1):39-46, 1969.

Stenosis of the common bile duct was produced in 5 male rabbits by wrapping the end of the duct with a sterile strip of cellophane soaked in sodium dicetylphosphate suspended in 50% alcohol. Gallstones were found at autopsies performed 60 days after surgery. Round ulcers, surrounded by a hyperemic zone, were found in the glandular part of the stomach in 2 rabbits. In addition to the ulcers, 2 other animals also had diffuse gastritis with superficial erosions and fibrinous deposits. The fifth rabbit had gastritis, primarily in the antrum and the prepyloric region, with hemorrhagic suffusion in areas of the submucosa. Histological studies showed that the gastric ulcers were typical peptic ulcers.

1393 PERSONAL CONTRIBUTION TO THE TREATMENT OF PEPTIC ULCER WITH A COMBINATION OF ANTIBIOTICS AND PREDNISONE. *(Sp.)*

Peñarroja Rabaza, J. (Fac. Med., Valencia, Spain). *Rev Esp Enferm Apar Dig* 28(1):35-56, 1969.

A total of 380 patients with peptic ulcers were given 100,000 or 200,000 IU of phenoxymethylpenicillin p.o., t.i.d. for 2 months; 600,000 IU of Benzitacil once a week or 1,200,000 IU every 15 days; and 500 mg of terramycin q.i.d. for 6 days followed by 250 mg q.i.d. for 6 days. Five days after institution of the antibiotic therapy patients received 15-20 mg/day of prednisone p.o. for 1 month and then 10 mg/day for another month. In addition some patients were given antacids, anticholinergic agents, calcium, vitamins, and anabolic agents. No complications developed in any of these patients. Medication was discontinued in 5 cases because of the patients' intolerance to these drugs. Complete remission of symptoms occurred within 20 days in 99.3% of these patients; 2 patients showed definite improvement after 15 days of treatment; and 1 had no improvement in symptoms. Radiological studies showed complete disappearance of the ulcer in 1-2.5 months except in 1 patient with a perforated ulcer. These findings strongly suggest that corticosteroid therapy produces no undesirable side effects in patients with peptic ulcers if it is combined with antibiotic therapy.

1394 ASSOCIATIONS OF GASTRIC AND DUODENAL ULCERS. *(Sp.)*

Aste, H. (Med. Sch., U. Chile, Valparaiso), A. Lucchini, L. A. Medina and S. Avendaño. *Rev Esp Enferm Apar Dig* 27(10):1455-1466, 1968.

Radiological signs of a duodenal ulcer were present in 33 of 372 patients with radiologically and/or endoscopically confirmed gastric ulcers. Of these 33 patients (28 men and 5 women, aged 30-85 yr), 17 had gastric and duodenal ulcers simultaneously and 16 had them successively. Five of the patients with simultaneous gastric and duodenal ulcers had histories of duodenal ulcers and 4 had histories of gastric ulcers. All 16 patients with successive gastric and duodenal ulcers had historie of duodenal ulcers, but none had ever had a gastric ulcer. In 19 of these 33 patients the gastric ulcer was located in the middle third of the stomach; the duodenal ulcer was found in the bulb in all cases. Mean gastric acid secretion was lower in all categories of patients with both gastric and duodenal ulcers than in those with duodenal ulcers alone. Histological studies of gastric mucosa from 20 patients with combined ulcers showe that only 2 had severe gastritis. Complications included bleeding in 21 cases, pancreatic penetration in 3, pyloric stenosis in 2, and 1 case each of pancreatic adhesions, stomach cancer, and perforation. Nine patients had no complications. Stomach ulcers responded to conservative treatment in 16 cases, surgery was performed in 15, and 2 patients refused to undergo surgery

1395 X-RAY THERAPY FOR DUODENAL ULCERS.

(It.) Bronzini, C. (Inst. Med. Symptomatol., U. Naples, Italy). *Rass Int Clin Ter* 48(24):1512-1516, 1968.

Case reports are presented for 2 men, aged 38 and 54 yr, with duodenal ulcers which did not respond to conservative treatment. Both patients were then given X-ray therapy (125 r every 4 days for a total dose of 1500 r). Radiological studies showed that the ulcers completely disappeared in both cases. X-ray therapy is recommended for duodenal ulcers when the ulcer does not respond to drug therapy or when immediate surgery is indicated.

1396 VAGOTOMY AND PYLOROPLASTY IN THE TREATMENT OF PEPTIC ULCERS. *(Nor.)*

Johnson, J. A. (Cent. Hosp., Tromso, Norway). *T Norsk Laegeforen* 89(4):241-243, 1969.

Bilateral selective vagotomy and pyloroplasty (Finney or Heinec-Mikulicz techniques) were used in the treatment of 43 of 62 patients with gastric (30 cases) or duodenal (26 cases) ulcers or dyspepsia (6 cases); these 62 cases included 18 with complications: 5 penetrating ulcers, 8 perforated ulcers, 4 cases of massive bleeding and 1 of stenosis. In 17 of the 43 cases treated b vagotomy and pyloroplasty, this was combined with excision of the ulcer (16 gastric ulcers and 1 duodenal). The results of this relatively new procedure, which is coming into increasing use in Norway as in other countries, were compared with those of Billroth II gastrectomy (11 cases), suture of the perforated ulcer (6 cases), suture plus gastrostomy (1 case), excision of the perforated ulcer (1 case), and pyloroplasty plus ulcer excision (1 patient with achlorhydria). There were 4 operative deaths, only one of which (in a patient with a penetrating duodenal ulcer) followed vagotomy and pyloroplasty. Gastric retention following vagotomy was observed in 5 cases (3 of 5 were transitory), and diarrhea was noted in 9. It is felt that vagotomy and pyloroplasty are the procedure of choice for uncomplicated duodenal ulcer, although more experience is required in its application.

1397 GASTRIC SECRETION AND PEPTIC ULCER: AN EXPERIMENTAL STUDY. I. CORTICOSTEROIDS AND PEPTIC ULCERS. *(Por.)* Goncalves, E. L. (Fac. Med., U. São Paulo, Brazil), R. G. Bevilacqua, M. C. C. Machado, J. B. Piovesan, N. Margarido, A. D. de Almeida, C. C. Musati, Y. Goncalvez, E. da Silva Bastos and A. Correa Netto. *Rev Ass Med Brasil* 14(4/6):81-86, 1968.

Histological examinations were made of stomachs from 34 fasting Wistar rats given 1-5 doses of prednisolone acetate (20 mg/100 g/day) and 16 fasting controls. Ulcers developed in the stratified nonsecretory epithelium of the forestomach in 14 of the controls, but not in rats given 1-3 doses of prednisolone acetate. Rats receiving 3 doses developed punctate hemorrhagic lesions in the glandular mucosa of the distal part of the stomach but the mucosa of the forestomach was normal. Ulcers were found in the glandular mucosa in 3 of 6 rats given 4 doses of prednisolone acetate and in 5 of 10 given 5 doses. Since prednisolone blood levels remain elevated for a long time, the effects of the hormone are probably not dependent on the lesions it produces in the gastric mucosa.

1398 REOPERATIONS FOR INEFFECTIVE VAGOTOMIES PERFORMED FOR PEPTIC ULCERS. *(It.)* Grassi, G. (San Giovanni Hosp., Rome, Italy), C. Orecchia and B. Sbuelz. pp. 485-518 in: Reinterventi in Chirurgia Gastro-Intestinale (Reoperations in gastrointestinal surgery), Rome, E.M.E.S., 1968.

Follow-ups of 691 patients subjected to gastric surgery and vagotomy for peptic ulcer showed that 2 patients (0.2%) had gastrointestinal atonia, 9 (1.3%) had dysphagia, and 2 had cholelithiasis. Postvagotomy malabsorption and diarrhea occurred in 0.9% after selective total vagotomy, but in 10.4% after truncal vagotomy and in 4.9% after selective anterior and posterior truncal vagotomy. Recurrent ulcers were found in 21 of 531 vagotomized patients (3.9%). Corrective surgery was performed in 19 cases. Recurrent ulcers were due to incomplete vagotomy in 12 patients, to insufficient gastric drainage in 3, to improper indications in 2, and to the use of nonabsorbable suture material in 2. Recurrent ulcers occurred most frequently in patients who had undergone vagotomy and gastroenterostomy (9 of 98 cases or 9.1%). The incidence was 3.6% after vagotomy and pyloroplasty (9 cases out of 245) and 0.5% after vagotomy and antrectomy (1 of 188 cases). No recurrences developed in 126 patients after vagotomy and Finney pyloroplasty or in 107 patients after vagotomy and antrectomy with Billroth I gastrectomies.

1399 EVALUATION OF SURGICAL TREATMENT FOR DUODENAL ULCERS. *(Sp.)* Villazón Sahagún, A., A. Matute, R. García López and J. Hidalgo. *Cir Cir* 36(6):620-644, 1968.

In a 10-yr period, 290 patients (225 men and 65 women, aged 17-82 yr) underwent a variety of surgical procedures for duodenal ulcers. Billroth II gastrectomies were performed on 187 and vagotomies, alone or in combination with other procedures, on 103. A significantly larger percentage of operations were performed between October and March than between April and September. This difference was even greater for emergency operations. Indications for surgery included penetration in 49.3%, lack of response to conservative therapy in 22.4%, stenosis in 10.7%, bleeding in 10.7%, and perforation in 4.1%. Ten patients also had peptic ulcers of the esophagus. Complications directly related to surgery developed in 33 cases (11.4%) and indirectly related complications or complications due to associated diseases in 26 (8.9%). Eight operative deaths occurred due to heart failure and bronchopneumonia, pulmonary embolism, recurrent bleeding and hepatic cirrhosis, stroke, shock, hepatic coma, acute pancreatitis and acute renal insufficiency, and acute adrenal insufficiency. Of these patients, 7 had subtotal gastrectomies and only 1 a vagotomy and antrectomy. Long-term complications included cholelithiasis undiagnosed at surgery in 16 cases and intestinal obstructions in 4. Three patients developed recurrent ulcers and 4 others had clinical or radiological symptoms of recurrent ulcers. Mild to severe dumping syndrome was observed in 27.6% and occurred significantly more often in patients who had undergone vagotomies. Results of surgery were excellent in 103 cases (60.6%), good in 49 (28.8%), satisfactory in 14 (8.2%), and poor in 4 (2.3%).

1400 ROUND-TABLE DISCUSSION OF GASTRIC ULCERS. *(Rum.)* Spârchez, T., T. Hunt, A. Jones, O. Fodor, I. Turaj, C. Debray, S. M. Rîss, M. Demole, C. Strat, E. Crăciun, D. Gerota and M. Augustin. *Med Intern (Bucur)* 20(9):1033-1060, 1968.

1401 GASTRIC ACID SECRETION AFTER HISTAMINE STIMULATION AND 24-HOUR URINARY 5-HYDROXYINDOLEACETIC ACID EXCRETION IN PATIENTS WITH GASTRIC AND DUODENAL ULCERS TREATED WITH SPASMOPHEN. *(Pol.)* Pokora, J. (2nd Int. Dis. Clin., Acad. Med., Lublin, Poland) and J. Czarnecki. *Pol Tyg Lek* 23(50):1925-1927, 1968.

1402 INDICATIONS AND RESULTS OF TOTAL GASTRECTOMY IN THE TREATMENT OF PEPTIC ULCER DISEASE: REPORT OF 10 CASES. *(Fr.)* Guillemin, G., A. Vachon, J. Cuilleret, J. Dubois, A. Michel, R. Lombard-Platet, P. Mikaeloff, A. Chapuis and F. Rolin. *J Med Lyon* 49(1154):1843-1855, 1968.

1403 LONG-TERM STUDIES ON GASTRIC SECRETION AND RADIOLOGICAL EVALUATION OF PATIENTS HAVING UNDERGONE PYLOROPLASTY AND RADICAL SUBDIAPHRAGMATIC VAGOTOMY. *(Pol.)* Popiela, T. (Acad. Med., Krakow, Poland), D. Karcz, A. Binda and E. Dolzycki. *Pol Przegl Chir* 50(1):10-18, 1969.

1404 VAGOTOMY AND ANTERIOR PYLORECTOMY FOR UNCOMPLICATED DUODENAL ULCERATION: RESULTS OF 38 CASES. *(E.)* Scott, P. R. (Royal Melbourne Hosp., Australia). *Aust New Zeal J Surg* 38(2): 141-143, 1968.

1405 THE PREVENTIVE ACTION OF ACETAZOLAMIDE ON RESTRAINT ULCERS IN THE WHITE RAT. *(Fr.)* Djahanguiri, B. (Fac. Med., U. Tehran, Iran) and D. Sadeghi. *Acta Gastroent Belg* 31(10):689-692, 1968.

1406 THE PHYSIOPATHOLOGY AND THERAPY OF GASTRODUODENAL ULCER. *(Fr.)* Cornet, A. (Laennec Hosp., Paris, France) and P. Carayon. *Sem Ther* 44(10):656-659, 1968.

1407 CLINICAL CHARACTERISTICS OF ACUTE BLEEDING ULCERS OF THE STOMACH IN PATIENTS WITH MYOCARDIAL INFARCTION. *(Rus.)* Gorb, G. D. (Med. Station, V. I. Lenin Machine-Building Plant, Novo-Kramatorsk, USSR), V. P. Simonova and B. G. Goriachkovskii. *Sovet Med* 31(12):110-112, 1968.

1408 REPEATED OPERATIONS ON THE STOMACH FOLLOWING SUTURE FOR GASTRODUODENAL ULCERS. *(Rus.)* Malov, G. I. (Republ. Hosp., Min. Hlth. Chuvash ASSR, Cheboksary, USSR). *Sovet Med* 31(12):26-30, 1968.

1409 MEDICAL TREATMENT OF UNCOMPLICATED PEPTIC ULCER. *(Ger.)* Bircher, J. (Med. Clin., U. Zurich, Switzerland) and U. P. Haemmerli. *Munchen Med Wschr* 111(6):273-277, 1969.

1410 BLOOD GROUPS AND GASTRIC SECRETION IN ULCER DISEASE. *(It.)* Misiti, G. (Santo Spirito Charitable Inst., Rome, Italy), B. Sbuelz and P. Malatesta. *Chir Gastroent* 2(4):410-423, 1968.

1411 ETIOLOGICAL RELATIONS BETWEEN PEPTIC ULCERS AND HYPERPARATHYROIDISM. *(Ger.)* Hartel, W. (North-West Hosp., Frankfurt/Main-Praunheim, Germany), G. Schuster and J. Lenz. *Fortschr Med* 87(1):27-29, 1969.

1412 THE CLINICAL PICTURE AND TREATMENT OF PEPTIC ULCERS ACCORDING TO THE DATA OF THE OUT-PATIENT DEPARTMENT OF THE 2ND CLINICAL HOSPITAL IN YEREVAN. *(Rus.)* Badalian, G. O. (Yerevan Med. Inst., USSR), A. A. Iesaian and E. G. Grigorian. *Ter Arkh* 40(10):95-97, 1968.

1413 BLOOD COAGULATION DEFECTS IN CONNECTION WITH BLEEDING PEPTIC ULCER. *(E.)* Heikinheimo, R. (Pori Gen. Hosp., Finland). *Punjab Med J* 18(3):119-123, 1968.

1414 ACUTE GASTRODUODENAL PERFORATIONS: A REPORT OF 153 CASES. *(E.)* Hassab, M. A. (Fac. Med., U. Alexandria, Egypt) and H. Zidan. *Alexandria Med J* 14(3/4):202-216, 1968.

1415 PEPTIC ULCER DISEASE DURING ADOLESCENCE. *(E.)* Marcus, J. (Jerusalem, Israel). *Israel Ann Psychiat* 6(2):149-161, 1968.

1416 PATHOGENESIS OF GASTRIC ULCER: AN EXPERIMENTAL MODEL. *(E.)* Ritchie, W. P. Jr. (U. Minnesota Med. Sch., Minneapolis) and J. P. Delaney. *Surg Forum* 19:312-313, 1968.

1417 EFFECTS OF SELECTIVE VAGOTOMY. *(E.)* Crow, R. W. (Marquette U. Sch. Med., Milwaukee, Wis.), W. J. Schulte, D. H. Winship and E. H. Ellison. *Surg Forum* 19:314-315, 1968.

1418 SLEEP THERAPY IN THE TREATMENT OF DUODENAL ULCER: REPORT OF A CASE. *(Por.)* Gomes, P. S. (Sicord Clin., Marinha, Brazil). *Hospital (Rio)* 74(4):1231-1234, 1968.

1419 THE SURGICAL TREATMENT OF GASTRIC ULCERS. *(Nor.)* Liavag, I. *T Norsk Laegeforen* 88(23):2194-2195, 1968.

1420 SIMULTANEOUS GASTRIC AND DUODENAL ULCERS. *(Fr.)* Edelmann, G. (Pitié Hosp., Paris, France). *Hopital (Paris)* 56(792,bis):575-580, 1968.

1421 THE DIFFICULTIES OF A PATIENT WITH A BILATERAL TRUNCAL VAGOTOMY PERFORMED FOR DUODENAL ULCER. *(Fr.)* Ionescu (Hosp. No. 1, Craiova, Romania), P. Tonitza, M. Vasilescu, V. Beldiman and M. Russu. *Mem Acad Chir (Paris)* 94(27/28):759-760, 1968.

1422 GASTRIC AND INTESTINAL CHANGES AFTER VAGOTOMY: RADIOLOGICAL OBSERVATIONS. *(E.)* Natale, C. (United Hosp., Foggia, Italy) and B. D'Ariano. *Acta Gastroent Belg* 31(12):906-910, 1968.

See also: 1069,1089,1202,1249,1254,1255,1262,1276,1280,1304,1308,
1313,1316,1317,1319,1321,1324,1336,1339,1340

Regional Enteritis

1423 **NECROTIZING ENTERITIS IN CROHN'S DISEASE OF THE SMALL BOWEL.** *(E.)* Mogadam, M. (Henry Ford Hosp., Detroit, Mich.) and R. J. Priest. *Gastroenterology* 56(2):337-341, 1969.

Among 6 patients with acute free perforation of the bowel and known regional enteritis of 1-17 yr duration, 3 (all males, 13-24 yr old) showed previously unreported multiple perforations with fulminating clinical courses (necrotizing enteritis) and fatal outcomes. The pathological picture in all 3 was similar: necrosis of the entire wall in numerous areas and multiple ulcerations in the jejunum as well as in the ileum. In many areas, ulcerations had reached the serosa with little or no inflammatory reaction; however, in some areas, diffuse infiltrations of lymphocytes and plasma cells and abscess formation were noted. No evidence of vascular changes or hemorrhage into the mucosa could be found, and no granulomata were seen in areas involved with the acute process. The administration of corticosteroids preceded the onset of free perforation in 1 patient and followed the 1st of a series of perforations in another. It is possible that steroids could have produced the fulminating processes seen in these 2 cases as a side effect of the drug.

1424 **CHRONIC NONSPECIFIC GRANULOMATOUS GASTRODUODENITIS (CROHN'S DISEASE) ASSOCIATED WITH PYLORIC STENOSIS. [CASE REPORT]** *(Ger.)* Toader, C. (3rd Surg. Clin., Cluj, Romania), G. Herman and A. Ban. *Zbl Chir* 94(5):171-174, 1969.

1425 **OPERATIVE MANAGEMENT OF AN UNUSUAL CASE OF REGIONAL ENTERITIS WITH DUODENAL INVOLVEMENT. [CASE REPORT]** *(E.)* Abourjaily, G. S. (Carney Hosp., Boston, Mass.), M. Carroll and E. Maher. *Amer J Gastroent* 51(1):55-60, 1969.

See also: 1453,1464,1472,1476,1493

1426 FAT AND NITROGEN BALANCE WITH MEDIUM-CHAIN TRIGLYCERIDES AFTER MASSIVE INTESTINAL RESECTION. *(E.)* Pinter, K. G. (Tulane U. Sch. Med., New Orleans, La.), H. Hyman III and O. Bolanos. *Amer J Clin Nutr* 22(1):14-20, 1969.

Fat and nitrogen balance studies were conducted over a period of 220 days on 3 patients (2 males and 1 female, 32-57 yr old) with significant steatorrhea and azotorrhea resulting from extensive intestinal resection in order to determine the therapeutic effects of isocaloric substitution of medium-chain triglycerides (MCT) for long-chain triglycerides (LCT). Substitution of the MCT diet for the LCT diet significantly reduced fecal fat excretion in all 3 patients (from 60 to 35, 31 or 40 to 21, and 60 to 24 g of fat/day, resp.). Abnormally low serum lipid levels also improved on the MCT-supplemented diet. One patient with diarrhea showed a decrease in the number of bowel movements. During the periods of reduced steatorrhea on the MCT diet, the patients had a favorable nitrogen balance (retained 1.2-3.8 g N/day) and gained 1-2 lb of weight. Return to the LCT diet resulted in increased steatorrhea and increased loss of nitrogen. It is suggested that the observed protein retention could be due to decreased intestinal motility, improved intestinal proteolysis or the beneficial effects of protein sparing due to the increased availability of calories.

1427 METABOLISM OF ALBUMIN AND FIBRINOGEN IN PATIENTS WITH TROPICAL SPRUE. *(E.)* Jeejeebhoy, K. N. (Tata Mem. Hosp., Bombay, India), A. M. Samuel, B. Singh, G. D. Nadkarni, H. G. Desai, A. V. Borkar and L. S. Mani. *Gastroenterology* 56(2):252-267, 1969.

The metabolism of albumin and fibrinogen was studied in detail in 6 normal subjects, 14 patients without gastrointestinal disease or hypoproteinemia, and 40 patients with tropical sprue. Using the arginine-G-^{14}C method, albumin synthesis was found to be reduced in 20 and normal or increased in 17 sprue patients. Serum albumin and total circulating albumin (TCA) were reduced in 14 and 11 of 20 patients with low synthesis, resp., and in 10 and 4 of 17 with normal or increased albumin synthesis, resp. While the mean serum albumin levels were similar in these 2 groups (2.72 ± 0.87 and 2.87 ± 0.48 g/100 ml resp.) the mean TCA was higher in patients with normal or high synthesis (1.50 ± 0.35 g/kg) than in those with low albumin synthesis (1.33 ± 0.42 g/kg). Increased gastrointestinal protein loss (measured by the use of ^{51}Cr-albumin or ^{95}Nb-albumin) was present in about half of the patients. However, there was no correlation between serum albumin levels and the degree of gastrointestinal loss, indicating that other factors contributed to the production of hypoalbuminemia. Low or normal catabolic rates in patients without gastrointestinal protein loss demonstrated that hypercatabolism was not a significant factor. Dilution of a normal total circulating albumin with a large plasma volume (10 cases) and a predominantly extravascular distribution of albumin contributed to hypoalbuminemia in some patients (24 cases). Malabsorption, dietary protein deficiency fecal nitrogen loss and reduced "labile nitrogen pool" also contributed to the reduction in albumin synthesis. Plasma fibrinogen and total circulating fibrinogen were significantly reduced (<143 mg% and <107.2 mg/kg, resp.) in 4 and 10 patients. In most cases, fibrinogen synthesis was normal and exceeded catabolism, suggesting that the reduced fibrinogen levels resulted from previously reduced synthesis. There was no relation between albumin and fibrinogen synthesis.

1428 LYMPHATIC OBSTRUCTION IN THE PATHOGENESIS OF INTESTINAL MUCOSAL ATROPHY. *(E.)* Fish, J. C. (U. Texas Med. Branch, Galveston), L. McNeel and W. J. Holaday. *Ann Surg* 169(3):316-325, 1969.

In 8 female dogs, noninflammatory lymphatic obstruction was produced by the injection of Silastic into the pedal lymphatics and ligation of the thoracic duct. The Silastic was noted to gel within 16 hr producing an obturator type obstruction. Leg and mesenteric lymphangiograms demonstrated changes in lymph stasis and lymphangiectasis in the retroperitoneal and mesenteric lymphatics. Major alterations produced included hypoalbuminemia, small intestinal mucosal atrophy, lymphocyte depletion in lymph nodes, and an increase in the lymphoid accumulations in the mucosa and submucosa of the bowel. Functional defects in intestinal absorption were not demonstrated. However, these experimentally produced structural alterations of the intestinal mucosa resembled, in various degrees, the intestinal changes found in many idiopathic malabsorption syndromes in man. Lymphatic obstruction is suggested as a component in the pathogenesis of intestinal atrophy.

1429 MACROGLOBULINEMIA AND STEATORRHEA: ROENTGEN AND PATHOLOGIC FINDINGS IN THE INTESTINAL TRACT. *(E.)* Khilnani, M. T. (Mount Sinai Hosp., New York, N. Y.), R. J. Keller and J. Cuttner. *Radiol Clin N Amer* 7(1):43-55, 1969.

The roentgenologic and pathologic features of a new symptom complex which includes primary or essential macroglobulinemia and steatorrhea are presented. Two women (55 and 60 yr old) and possibly a third (46 yr old) with some clinical features of Waldenström's syndrome, but with the dominant complaint of diarrhea occurring early in the course of the disease, demonstrated primary macroglobulinemia consisting of a relatively homogeneous band of IgM. Immunoelectrophoresis revealed both 19S and 7S components in the 1st patient and predominantly 19S elements in the second case. The other immunoglobulin components were considerably decreased. Steatorrhea and other signs of malabsorption as well as splenomegaly and lymph node enlargement were also present. X-ray studies revealed dilatation of the small intestine and thickening of the mucosal folds. The folds were not nodular or ulcerated. In addition, a fine "sandlike" granular appearance of the mucosal surface was superimposed on the fold pattern. Biopsy revealed that distended clubbed villi, the lymph spaces of which contained eosinophilic, proteinaceous material, were responsible for the "sandlike" background. Two patients showed no signs of neoplasm; however, the 46-yr-old woman had discrete neoplastic stenosis in 2 areas of the small intestine and lymphosarcoma in peripheral lymph nodes and the lungs. The latter case may represent the same symptom complex as the other 2 cases, with 1 cell, the lymphocyte, as the dominant cell.

1430 INTESTINAL ANTIBODIES TO WHEAT FRACTIONS IN CELIAC DISEASE. *(E.)* Katz, J.

(Yale U. Sch. Med., New Haven, Conn.), F. S. Kantor and T. Herskovic. *Ann Intern Med* 69(6):1149-1153, 1968.

Serum specimens and stool or small intestinal fluid from 22 patients with confirmed celiac disease and 51 controls with and without other diarrheal diseases were studied by microdouble immunodiffusion in agar gel plates. Precipitins to the peptic-tryptic digest of gluten, fraction III, were found in the intestinal secretions of 12 of the 22 patients with celiac disease but in none of the control specimens. Of 10 patients with celiac disease who were ingesting gluten, 7 had demonstrable precipitins in their intestinal secretions. Three celiac children on a regular diet had precipitating substances in the stool extract. Precipitins were demonstrated more than 6 months after the elimination of dietary gluten in 3 patients who were then in clinical and laboratory remission. Precipitins were more often detected in the small bowel fluid than in the stool. The precipitating substance may therefore originate in the upper intestine where the gluten effect is maximal. Serum IgA concentrations were increased, and significant red cell agglutination titers were present in all celiac disease patients except 2 who had hypogammaglobulinemia and hypoalbuminemia. IgA concentrations and hemagglutination titers declined after dietary gluten withdrawal. None of the controls had precipitins to fraction III or hemagglutination titers greater than 1:32.

1431 TWO PATIENTS WITH EXTENSIVE RESECTION OF THE SMALL INTESTINE AND ONE PATIENT WITH INTESTINAL LYMPHANGIECTASES TREATED WITH MEDIUM CHAIN TRIGLYCERIDES. *(Dut.)* van Enter, C. H. J. (Juliana Hosp., Veenendaal, Netherlands), A. H. Lely and N. Rodenburg. *Nederl T Geneesk* 113(1):17-21, 1969.

1432 INTESTINAL LYMPHANGIECTASIA WITH IMMUNOGLOBULIN A DEFICIENCY. *(E.)* Eisner, J. W. (Temple U. Health Sci. Ctr., Philadelphia, Pa.) and S. P. Bralow. *Amer J Dig Dis* 13(12):1055-1064, 1968.

1433 GLUCOSE-GALACTOSE MALABSORPTION COMPLICATED BY MONILIAL ARTHRITIS. [CASE REPORT] *(E.)* Pruitt, A. W. (Emory U. Sch. Med., Atlanta, Ga.), J. L. Achord, F. W. Fales and J. H. Patterson. *Pediatrics* 43(1):106-110, 1969.

1434 PHYSIOPATHOLOGY OF THE MALABSORPTION SYNDROMES. *(Rum.)* Hossu, T. (Hematol. Ctr., Bucharest, Romania) and A. Vîlcu. *Med Intern (Bucur)* 20(9):1069-1079, 1968.

1435 SECONDARY (NON-GLUTEN-INDUCED) CELIAC DISEASE WITH INTESTINAL PROTEIN LOSS IN THE COURSE OF IRON-DEFICIENCY ANEMIA IN A 12-MONTH-OLD INFANT. *(Pol.)* Zieleźnik, E. (Pediat. Dis. Clin., Silesian Acad. Med., Zabrze, Poland) and J. Zareba. *Pol Tyg Lek* 23(50):1935-1936, 1968.

1436 LACTOSE INTOLERANCE IN SOUTH AMERICAN INDIANS. *(E.)* Alzate, H. (Fac. Med., U. Caldas, Manizales, Colombia), H. González and J. Guzmán. *Amer J Clin Nutr* 22(2):122-123, 1969.

1437 RECENT CONTRIBUTIONS IN INTESTINAL ABSORPTION AND MALABSORPTION: A REVIEW. *(E.)* Floch, M. H. (Yale U. Sch. Med., New Haven, Conn.). *Amer J Clin Nutr* 22(3):327-351, 1969.

1438 PROTEIN MALNUTRITION AND THE SMALL INTESTINE. *(E.)* Herskovic, T. (Yale U. Sch. Med., New Haven, Conn.). *Amer J Clin Nutr* 22(3):300-304, 1969.

1439 INFLUENCE OF INTESTINAL BACTERIA ON BILE ACID METABOLISM AND FAT ABSORPTION: CONTRIBUTIONS FROM STUDIES OF BLIND-LOOP SYNDROME. *(E.)* Rosenberg, I. H. (Boston City Hosp., Mass.). *Amer J Clin Nutr* 22(3):284-291, 1969.

1440 INADEQUATE INTESTINAL DIGESTION OF LACTOSE. *(E.)* Bayless, T. M. (Johns Hopkins U. Sch. Med., Baltimore, Md.) and S. S. Huang. *Amer J Clin Nutr* 22(3):250-256, 1969.

1441 GLUTEN, INFANT FEEDING AND CELIAC DISEASE. *(E.)* Anonymous. *Ann Nestle (Paris)* 19:102-105, 1968.

1442 STUDY OF IRON DISTRIBUTION IN A SMALL INTESTINAL BIOPSY SPECIMEN OBTAINED FROM A PATIENT WITH WHIPPLE'S DISEASE, USING A CASTAING MICROCATHETER. *(Fr.)* Duprez, A. and G. Rauber. *Ann Anat Path (Paris)* 13(3):373-378, 1968.

1443 TWO CASES OF GLUTEN ENTEROPATHY WITH PRURITUS. *(Heb.)* Mandel, D. (Clinic, Kibbutz Mizra, Israel). *Dapim Refuiim* 27(7/8):297-303, 1968.

1444 LACTOSE INTOLERANCE IN THAILAND. *(E.)* Flatz, G. (Human Gen. Lab., Chiang Mai U., Thailand), C. Saengudom and T. Sanguanbhokhai. *Nature* 221(5182):758-759, 1969.

See also: 1037,1183,1197,1215,1508

1445 CARCINOMAS OF THE LARGE INTESTINE TREATED AT THE LONDON HOSPITAL BETWEEN THE YEARS 1937 AND 1966, INCLUSIVE.

(E.) Butler, E. C. B. (London Hosp., England). *Bull Soc Int Chir* 27(5):420-427, 1968.

The operative treatment of carcinoma of various parts of the large intestine (178 cases) and rectum (642 cases) is described on the basis of 820 patients seen during the period 1937-1966. The frequency of colonic cancer was greater in females; rectal cancer was more common in males. Two-stage operations were performed in carcinomas of the right (4 of 46 cases), transverse (6 of 24 cases), left (12 of 17) and pelvic (14 of 52 cases) colon presenting with obstruction. Carcinomas of the rectum were treated by abdomino-perineal excision (374 cases), anterior resection (148 cases), Hartmann's operation (44 cases), pull-through (6 cases), and colostomy alone (70 cases). Mortality was 5.7% for colonic carcinoma, 5, 7.5, 13.5 and 18% for rectal cancer treated by abdomino-perineal excision, anterior resection, Hartmann's procedure or colostomy only, resp. Patients with a temporary colostomy showed a better chance of survival since the risk of sepsis was reduced. The 5-yr survival rate in Duke's grade A cases was 67% for colonic and 73% for rectal cancer; when acute intestinal obstruction was present, survival was only 29%. For grade B and C cases, the 5-yr survival was 40 and 28%, resp. for cancer of the colon, and 39 and 19%, resp. for cancer of the rectum. These results emphasize the importance of early diagnosis in large intestine cancer.

1446 MICROANGIOGRAPHIC INVESTIGATIONS ON ACUTE APPENDICITIS.

(E.) Lindgren, I. (Dept. Path. Anat., U. Turku, Finland) and A. J. Aho. *Acta Chir Scand* 135(1):77-82, 1969.

Microangiographic and histologic studies were made of 22 freshly excised appendices injected through the main appendicular artery with 10% barium sulfate. In 5 patients (2-78 yr old) with appendices classified histologically as normal, a rich vascular network with 2 plexi in the subserosa and in the submucosa, was observed. Anastomoses between these plexi were less frequent in older subjects. In 3 patients (14-20 yr old) with histologically normal appendices and mesenteric lymph node hyperplasia, the microangiographic picture appeared normal. In 4 cases (10-23 yr old) classified histologically as limited appendicitis, the normal vascular anatomy was also observed. Ten patients (8-44 yr old) with a histologic diagnosis of completely inflamed appendicitis showed occlusion of the arteries due to arterial or arteriolar thrombosis or acute arterial inflammation. In 3 cases with a fecal stone in the lumen of the appendix, there was diminished filling of the arterioles next to the stone, probably caused by compression of the vessels. These findings support previous observations that the arteries of the distal part of the appendix can be considered end arteries. This fact favors the development of vascular disturbances, leading to wall necrosis of the appendix.

1447 ROENTGENOLOGICAL TRANSIT TIMES THROUGH THE COLON FOLLOWING APPENDECTOMY.

(E.) Noer, T. (Ulleval Hosp., Oslo, Norway). *Acta Chir Scand* 135(1):91-93, 1969.

Colonic motility was investigated in the immediate postoperative period by roentgenologically following the progress of various contrast media deposited in the cecum during 30 appendectomies. Barium sulfate suspension (30 ml) remained in the ascending colon for the 1st 2 postoperative days then it moved on into the distal colon or rectum within 24 hr. Commercial Gastrografin (20 or 30 ml) progressed rapidly during the 1st few hr after surgery, indicating that no complete paresis of intestinal movement existed at this time. A period of slow forward movement or complete standstill of the contrast medium followed, but the pattern was less uniform than with barium. In many cases the contrast reached the rectum earlier than in the barium series. It is suggested that the Gastrografin medium is rapidly diluted in the bowel because of its hypertonicity, with subsequent increase in volume and mechanical stimulation of the intestine. As it progresses, tonus and peristalsis probably occur. Isotonic Gastrografin (30 ml) showed a passage pattern resembling that of the barium contrast, indicating that Gastrografin exerts no specific peristalsis-provoking action on the intestine. Flatus was observed to advance in the intestine independently of the contrast media. There may thus be separate transport mechanisms for gas and fluids.

1448 CLINICAL AND SURGICAL FEATURES OF RECTAL CARCINOMA ON THE BASIS OF 505 CASES.

(Ger.) Benz, G. (Surg. Clin., U. Basel, Switzerland). *Landarzt* 44(34):1668-1680, 1968.

The average age of 505 patients treated for rectal cancer (between 1952 and 1966) was 64.4 yr; 1/3 of the patients were over 70 yr old at the time of diagnosis. The average history dated back 8 months, and 22% of the patients had been treated as outpatients for 9.5 months. About 70% of these patients presented with bleeding and disorders in defecation; 3.2% were admitted as emergency cases with ileus. Adenocarcinomas were found in 90%, and 6.7% also had carcinomatous polyps. About 70% of the tumors were palpable on rectal examination. Metastases into the lymph nodes were present in 35% and distant metastases in 16%. The surgical procedures most commonly employed were combined rectal amputation or a sphincter-retaining anterior resection. The Hartmann or Lockhart-Mummery procedures were used for patients in the high surgical risk group. X-ray therapy was used alone or in combination with surgery for superficial anal carcinomas. Tumors were removed in 81.4% of the patients, a palliative colostomy was performed in 13.7%, and 4.9% were inoperable. The most common local postoperative complications were infections in the operated region and in the descending urinary passages. Other complications included insufficiency of the anastomosis after anterior resection, postoperative ileus, and hemorrhages produced by anticoagulants. Pneumonia was the most common complication not directly related to surgery. The operative mortality was 12% for all patients. Peritonitis and pneumonia were the most common causes of death. The 5-yr survival rate for all patients operated on between 1952 and 1961 was 36.2%; the 10-yr survival rate was 34.1%. After 5 yr 15.2% of the patients with lymph node metastases and 50% of those without lymph node metastases were still alive. The 5-yr survival rate was 60% for patients with a carcinoma more than 10 cm from the anus and 40.1% for those with tumors located lower in the rectum. The 5-yr survival rate was 57.4% after anterior resections and 37.9% after combined rectal amputation. Five yr after the Hartmann and Lockhart-Mummery procedures 33.3% of the patients were still alive.

1449 **OBSERVATIONS ON THE BEHAVIOR OF THE pH OF THE RECTAL MUCOSA UNDER NORMAL AND PATHOLOGICAL CONDITIONS.** *(It.)* Jori, G. P. (Inst. Spec. Med. Path., U. Naples, Italy), G. Mazzacca and R. Perrone Donnorso. *Rass Int Clin Ter* 48(21):1307-1311, 1968.

The pH of the rectal mucosa was measured at several different levels in 41 subjects (25 controls, 9 patients with ulcerative colitis, and 7 with rectosigmoid carcinoma). The pH of the rectal mucosa did not vary appreciably with age and sex among normal subjects, averaging 7.9 ± 0.120, but was significantly lower in patients with ulcerative colitis (6.9 ± 0.070) and those with rectosigmoid adenocarcinomas (6.9 ± 0.70). In cancer patients, variable reductions in pH were also detected at distances up to 5-6 cm from the actual neoplasm.

1450 **"SOLITARY" NONSPECIFIC ULCERS OF THE COLON.** *(E.)* Butsch, J. L. (Mayo Clin., Rochester, Minn.), M. B. Dockerty, D. B. McGill and E. S. Judd. *Arch Surg* 98(2):171-174, 1969.

Data from 22 patients (15 males and 7 females, 27-71 yr old) treated for nonspecific ulcers of the colon between 1911 and 1963 were analyzed with regard to clinical features, pathologic features, treatment and follow-up. Clinical features indistinguishable from those of acute perforative appendicitis were evident in 2 patients. In 15 patients, there was upper or lower abdominal pain, unrelated to the intake of food and sometimes relieved by dejection. Four patients had diarrhea, in 6 cases there was passage of blood from the rectum, and 6 patients were constipated. Roentgenologic studies in 15 patients demonstrated a constricting lesion in 5, an annular mass in 2, an intramural lesion in 2, and a polypoid growth in 1. Treatment was surgical for all 22 patients, with 21 undergoing resection. There were no operative deaths and no patient experienced recurrences of the original lesion. In all but 2 patients, the ulcers were solitary, while 37% of the lesions affected the sigmoid flexure and 9% affected the cecum. The remaining ulcers were randomly distributed over the ascending, transverse and descending segments of the colon. The location was predominantly antimesenteric. Perforation was evident in 2 of the 3 cecal lesions, but the ulcers in the remaining cases were grossly confined to the mucosa and submucosa. It is pointed out that diagnosis is rarely made preoperatively and that this condition is usually first discovered when the excised specimen is examined.

1451 **CARCINOMA OF THE COLON IN YOUNG PEOPLE.** *(Pol.)* Kulicz, A. (3rd Surg. Clin., Silesian Acad. Med., Bytom, Poland) and J. Skrzypek. *Pol Przegl Chir* 40(11):1331-1333, 1968.

Based on the case reports of 3 young patients with carcinoma of the colon (2 males and 1 female, 23-29 yr old) encountered among 93 patients treated for this disease during a 13-yr period, it is pointed out that the symptoms are essentially the same as those found in elderly persons. The surgical technique is also the same, but the prognosis is much poorer in young patients. Histologically, these tumors in the young are usually adenocarcinoma muciparum or gelatinosum (one of each among the 3 cases described). Two of the 3 patients, who were operated on after having had symptoms for 5-7 months, remain alive (one after 8 yr); the 3rd patient had had symptoms for 2 yr at the time of surgery and died 3 weeks later.

1452 **CONTACT pH OF RECTAL MUCOSA IN HUMANS AND DOGS.** *(E.)* Bitterman, W. (Mayo Clin., Rochester, Minn.), R. J. Spencer, K. A. Huizenga and R. G. Shorter. *Dis Colon Rectum* 12(2):96-98, 1969.

A technique to measure the pH on the surface of rectal mucosa of humans and dogs is described. The mean value for 121 normal subjects (7.9 ± 0.067) was compared with values for 17 patients with active ulcerative colitis, 4 patients with inactive ulcerative colitis, 15 patients with functional diarrhea, 29 patients with adenomatous polyps, 14 patients who had undergone polypectomy, 10 with rectal carcinoma, 13 who had undergone intestinal resections, and 21 dogs. Statistically significant abnormal values were noted in patients with active chronic ulcerative colitis (6.9 ± 0.175), adenomatous polyps (8.2 ± 0.07), or rectal carcinoma (7.6 ± 0.26) and in those patients who had colonic resection for rectal carcinoma (8.2 ± 0.010). The lowered values for the group with active colitis and the group with rectal carcinoma were considered to be due to tissue damage. The elevated values for the group with polyps and the previously resected rectal carcinomas were unexplained. The values in patients who had functional diarrhea or inactive colitis or who previously had had polypectomies were not statistically different from the values seen in controls. The pH of the rectal mucosa in dogs was found to be 7.5 ± 0.06.

1453 **CROHN'S DISEASE OF THE COLON (NOTES ON 10 CASES).** *(Fr.)* Laumonier, R. (Hosp. Ctr., U. Rouen, France), F. Potet and A. Fondimare. *Ann Anat Path (Paris)* 13(4):433-448, 1968.

The most characteristic lesions found on gross examination of the left colon in 10 patients with granulomatous colitis were longitudinal ulcerations and transverse crevasses forming rows of "cobblestones" in the mucosa. Microscopic examination revealed submucosal edema, inflammation at the bottom of the ulcerations, a tendency toward fistula formation, epitheloid granulomas in the submucosa and subserosa, and an intact mucosa between the ulcerations. From the histological findings it is postulated that granulomatous colitis is a disease of the lymphatic system of the colon. Lesions first occur in enclosed follicles and/or lymph ducts, the epithelium of which becomes desquamated and destroyed. Then lymphedema appears and, in 75% of the cases, granulomatous follicles are observed. Mucosal ulceration produces submucosal inflammation and granulation tissue with leukocyte infiltration. This reaction spreads along adjacent edematous channels and can result in suppuration and fistula formation. The topography and morphology of these lesions suggest that an immune mechanism is involved in their genesis.

1454 **THE CLINICAL PICTURE IN ACUTE NECROTIC ENTEROCOLITIS.** *(Ger.)* Dabels, J. (Med. Clin., U. Rostock, Germany). *Z Ges Inn Med* 23(23):779-782, 1968.

Acute necrotic enterocolitis was found in 40 of 1552 patients autopsied between 1962 and 1967. Patients included 25 women and 15 men, aged 26-86 yr, with an average age of 61 yr, 20 of whom died in 1967. The diagnosis was made before death in 7 patients with profuse diarrhea and bloody and foamy stools. Shock was an etiological factor in 13 cases. Eight patients had undergone 1 or more surgical procedures. Antibiotics were implicated in 30 patients: tetracyclines in 20 cases, penicillin in 18, streptomycin in 9, chloramphenicol in 8, methicillin in 4, antimycotics in 4, ampicillin in 1, and novobiocin in 1. Long-term prednisone and cytostatic therapy had been given to 11 patients with hematological diseases. Bacteria isolated from stool specimens and autopsy material consisted primarily of hemolytic *Staphylococcus aureus* and, to a lesser extent, *Pseudomonas aeruginosa, Proteus vulgaris, Escherichia coli,* enterococci, *Klebsiella, Aerobacter,* and *Clostridium.* Necrotic changes were found in both the small and large intestine in 15 cases, in the large intestine in 12, and in the small intestine in 12. One patient had necrotic rectosigmoiditis.

1455 COLITIS AND URINARY TRACT DISEASES - AN ASSOCIATION. *(E.)* Kasliwal, R. M. (S. M. S. Hosp., Jaipur, India, S. Agarwal, J. P. Sethi and U. S. Mathur. *Amer J Proctol* 19(6):411-416, 1968.

1456 CYTOMEGALY IN A CHILD WITH CONGENITAL MEGACOLON. *(Ger.)* Hagmann, R. (Pediat. Clin., U. Bern, Switzerland), F. Kuffer, R. Moser and M. Bettex. *Schweiz Med Wschr* 99(1):17-20, 1969.

1457 A CLINICAL AND HISTOLOGICAL STUDY OF POLYPOSIS OF THE COLON. *(Fr.)* Turcot, J. (Dept. Surg., U. Laval, Quebec, Canada). *Bull Soc Int Chir* 27(5):415-419, 1968.

1458 APPENDICITIS IN PREGNANCY. *(Dut.)* Wymenga, J. H. (Gen. Prov., Munic. and Acad. Hosp., Groningen, Netherlands) and J. Bennin. *Nederl T Geneesk* 113(1):6-10, 1969.

1459 EMERGENCY HEMICOLECTOMY FOR ACUTE TOTAL VOLVULUS OF THE RIGHT COLON. *(It.)* Dal Zotto, E. *Chir Gastroent* 2(4):472-477, 1968.

1460 RADICAL SURGERY FOR PERIANAL ABSCESSES. *(Sp.)* Garriz, R. A. (Rawson Hosp., Buenos Aires, Argentina), J. A. Rodriguez Martin and E. S. Luchetti. *Prensa Med Argent* 55(30):1463-1468, 1968.

1461 MULTIPLE SYNCHRONOUS PRIMARY CARCINOMA OF THE COLON. [CASE REPORT] *(E.)* Chowdhury, S. R. (Hawera Hosp., New Zealand). *Aust New Zeal J Surg* 38(2):122-125, 1968.

1462 THE UNUSUAL ANAL FISTULA. *(E.)* Wilson, E. (Sydney Hosp., Australia). *Dis Colon Rectum* 11(5):348-355, 1968.

1463 NEURILEMMOMA OF THE RECTUM AND PERIRECTAL AREA: REPORT OF A CASE. *(E.)* Sabchareon, V. (Philadelphia, Pa.), H. E. Bacon and A. R. Gennaro. *Dis Colon Rectum* 11(5):356-358, 1968.

1464 ISOLATED ANORECTAL LOCALIZATION OF INTESTINAL GRANULOMATOSIS OR CROHN'S DISEASE. *(Fr.)* Rudell, M., F. Gontier and A. Smadja. *Mem Acad Chir (Paris)* 94(23/24):683-687, 1968.

1465 RECTOSIGMOID ANGIOMATOSIS. *(Fr.)* Loygue J. and P. Lagneau. *Mem Acad Chir (Paris)* 94(23/24):669-672, 1968.

1466 ACUTE APPENDICITIS IN 1968. *(Sp.)* Ivanissevich, O. and C. I. Rivas. *Rev Esp Enferm Apar Dig* 27(9):1331-1338, 1968.

1467 ISCHEMIC COLOPATHIES. *(Fr.)* Olivier, C. (Tenon Hosp., Paris, France), P. Robert, G. Di Maria, M. Favre and O. Baur. *Mem Acad Chir (Paris)* 94(21/22): 628-632, 1968.

1468 ACUTE INTESTINAL OCCLUSION DUE TO PSEUDOMUCOUS CYST OF THE APPENDIX. *(Pol.)* T. Jastrzebski (2nd Surg. Clin., Acad. Med., Lublin, Poland) and W. Woźniacki. *Pol Przegl Chir* 50(1):77-78, 1969.

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1471 SURGICAL TREATMENT OF DIVERTICULITIS OF THE COLON. *(E.)* Reeves, C. D. (Dept. Surg., Riverside Community Hosp., Calif.), L. Raterman and H. H. Belding. *Amer Surg* 35(3):203-209, 1969.

1472 REGIONAL COLITIS OR CROHN'S DISEASE OF THE LARGE INTESTINE. *(Cz.)* Mařatka, Z. (Na Bulovce Hosp., Prague, Czechoslovakia), D. Kubernátová, J. Kudrmann and V. Čapek. *Cas Lek Cesk* 107(49):1473-1482, 1968.

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1474 PREVENTION AND TREATMENT OF DOUGLAS-SPACE ABSCESSES FOLLOWING APPENDECTOMY. *(Rus.)* Kozlov, M. A. (Med. Clin., Cherepovets Metallurgical Works, USSR). *Sovet Med* 31(11):87-90, 1968.

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1476 THE DIFFERENTIAL DIAGNOSIS BETWEEN ULCERATIVE COLITIS AND CROHN'S DISEASE OF THE COLON. *(Dan.)* Riis, P. (Copenhagen Munic.

Hosp., Gentofte, Denmark) and P. Anthonisen. *Ugeskr Laeg* 131(1):6-9, 1969.

1477 **SYMPOSIUM ON ANAL FISSURE: ITS CAUSES, DIAGNOSIS AND TREATMENT.** *(Jap.)* Tsuchiya, S. (1st Dept. Surg., U. Tokyo, Japan), T. Yamamoto, K. Masuda, H. Masuda, M. Arakawa, M. Nakatsuka, S. Tanaka, Y. Muraoka, S. Maeda, A. Fujii, T. Shishido, T. Matsui, S. Tokunaga, S. Noda, K. Satomura and R. Muraoka. *J Jap Soc Coloproctol* 21(4):76-86, 1968.

1478 **INTERNAL COLONIC FISTULAS.** *(It.)* Zanini, P., N. Ludovico and A. Angeli. *Osped Ital Chir* 19(Suppl. 11):1-96, 1968.

1479 **FIVE HUNDRED OPERATIONS FOR APPENDICITIS.** *(E.)* Swink, R. L. (Dept. Surg., U. Miami, Fla.). *Amer Surg* 35(2):149-151, 1969.

1480 **SURVIVAL AFTER OBSTRUCTION OF THE COLON BY CARCINOMA.** *(E.)* Watters, N. A. (Dept. Surg., U. Toronto, Canada). *Canad J Surg* 12(1):124-128, 1969.

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1482 **THE EFFECT OF A NEW MUSCULOTROPIC SUBSTANCE (MEBEVERINE) ON IRRITABLE COLON.** *(E.)* De Groote, J. (St. Raphael. Hosp., U. Louvain, Belgium) and L. Standaert. *T Gastroent* 11(5):524-528, 1968.

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1484 **CARCINOMA OF THE COLON.** *(E.)* Muir, E. G. (King's Coll. Hosp., London, England). *J Roy Coll Surg Edinb* 14(2):83-88, 1969.

1485 **SPONTANEOUS HAEMORRHAGE FROM THE MIDDLE COLIC ARTERY: A REPORT OF TWO CASES AND A REVIEW OF THE LITERATURE ON SPLANCHNIC HEMORRHAGE.** *(E.)* Taylor, R. S. (London Hosp., England). *J Roy Coll Surg Edinb* 14(2):98-106, 1969.

1486 **INFLAMMATORY COLON STENOSES.** *(E.)* Dietz, M. W. (Burke-Protestant Hosp., Springfield, Mo.). *Missouri Med* 66(1):38-40, 1969.

1487 **COLIC ANGINA AND GANGRENE OF THE TRANSVERSE COLON IN POLYCYTHEMIA VERA: CASE REPORT AND REVIEW OF LITERATURE.** *(E.)* de Prophetis, N. (Crozer-Chester Med. Ctr., Chester, Pa.) and I. T. Khubchandani. *Dis Colon Rectum* 12(2):142-146, 1969.

1488 **CONDYLOMA ACUMINATUM TREATED WITH LIQUID NITROGEN: REPORT OF FIVE CASES.** *(E.)* Nahr, K. S. (Lahey Clin. Found., Boston, Mass.), S. L. Moschella and N. W. Swinton Sr. *Dis Colon Rectum* 12(2):125-128, 1969.

1489 **REPAIR OF ANORECTAL VAGINAL FISTULA UTILIZING SEGMENTAL ADVANCEMENT OF THE INTERNAL SPHINCTER MUSCLE.** *(E.)* Belt, R. L. Jr. (Glendale, Calif.) and R. L. Belt. *Dis Colon Rectum* 12(2):99-104, 1969.

1490 **CANCER OF THE COLON AND RECTUM - GENERAL ASPECTS, DIAGNOSIS, TREATMENT, AND PROGNOSIS: A REVIEW.** *(E.)* Scudamore, H. H. (Mayo Clin., Rochester, Minn.). *Dis Colon Rectum* 12(2):105-114, 1969.

See also: 1070,1214,1234,1240,1252,1259,1263,1265,1349,1366,1367,1368

1491 **IMMUNOLOGICAL STUDIES IN ULCERATIVE COLITIS. IV. ORIGIN OF AUTOANTIBODIES.** *(E.)* Lagercrantz, R. (Wenner-Gren Inst. Exp. Biol., U. Stockholm, Sweden), S. Hammarström, P. Perlmann and B. E. Gustafsson. *J Exp Med* 128(6):1339-1352, 1968.

Passive hemagglutination tests with a heat-stable colon extract from germ-free Swedish inbred rats demonstrated that the height and incidence of elevated anticolonic antibody titers were significantly increased in ulcerative colitis patients as compared to healthy age- and sex-matched controls or to patients with amebic liver abscess or dysentery. Sera from ulcerative colitis patients also had elevated titers and increased incidence of antibodies to a heat-stable antigen of *E. coli* 014. No relation could be demonstrated between antibody titers to *E. coli* 014 and duration and severity of the disease, extent of colon involvement, or presence of extracolonic manifestations. The antibody pattern to *E. coli* 014 in patients with amebic dysentery, whose colonic lesions were comparable in severity to those of ulcerative colitis, was indistinguishable from that of the healthy controls. No deviations from the normal antibody pattern were found in regard to *Staphylococcus aureus* S209, *Clostridium difficile,* sheep red cells (Forsman antigen), or other common *E. coli* strains (07, 075, 06). Absorption with *E. coli* 014 antigen inhibited the hemagglutination reaction between colon sensitized sheep cells and sera from ulcerative colitis patients in 13 of 44 cases, but no inhibition was observed with *E. coli* 07 or 075. Significant inhibition of the anti-*E. coli* 014 reaction was obtained in 2 of 16 ulcerative colitis sera. Hemagglutination inhibition studies demonstrated that the antigen common to *E. coli* 014 and colon is related to the heterogenetic common antigen of the Enterobacteriaceae. These findings support the possibility of autoimmunization in ulcerative colitis arising from breakage of tolerance by cross-reacting bacterial antigen. However, since this antigen is present even in healthy persons, additional factors must account for the occurrence of elevated autoantibodies to colon in ulcerative colitis.

1492 **THE GRANULOCYTIC RESPONSE IN NONSPECIFIC ULCERATIVE COLITIS.** *(E.)* Levine, M. L. (Bellevue Hosp., New York, N. Y.) and R. L. Engle Jr. *Amer J Dig Dis* 14(2):69-79, 1969.

White blood counts were determined in 134 of 165 patients (82 men and 83 women, 75% between 20 and 50 yr old) with active ulcerative colitis. Five patients had neutropenia; 1 of these 5 had agranulocytosis. The majority (72 of 134) had a moderate leukocytosis of 10,000-20,000 with immature elements. In 2 patients, a leukemoid reaction was seen. In the patients with depressed leukocyte counts, normal marrow production and massive rectal loss of white cells were noted. The degree of polymorphonuclear leukocytosis was positively correlated with the severity of anemia and the extent of colonic involvement; it was unrelated to the severity of the fever or diarrhea, or to the duration of the illness. Leukocytosis and/or shift-to-the-left was often associated with normal or increased eosinophil and lymphocyte counts. The peripheral leukocyte count in ulcerative colitis is only a single point in the dynamic continuum of production and loss of leukocytes into the colonic wall and lumen.

1493 **FURTHER STUDIES OF *IN VITRO* CYTOTOXICITY OF LYMPHOCYTES FROM PATIENTS WITH ULCERATIVE AND GRANULOMATOUS COLITIS FOR ALLOGENEIC COLONIC EPITHELIAL CELLS INCLUDING THE EFFECTS OF COLECTOMY.** *(E.)* Shorter, R. G. (Mayo Clin., Rochester, Minn.), M. Cardoza, R. J. Spencer and K. A. Huizenga. *Gastroenterology* 56(2): 304-309, 1969.

Lymphocytes from the peripheral blood of patients with chron ulcerative or granulomatous colitis (15 males and 12 females, 16-17 yr old, including 2 with regional enteritis) showed cytotoxic activity for allogeneic colonic epithelial cells after 4 hr incubation at 37C in the presence of complement. The mean survival of colonic epithelial cells was 71.6 and 72.4% of the 100,000 viable cells incubated with lymphocytes from ulcerative and granulomatous patients, resp. No cytotoxic activity was demonstrated (92.8% survival) for lymphocytes from normal subjects (10 males and 10 females, 23-47 yr old) or patients with diseases other than colitis (8 males and 18 females, 20-79 yr old, with diverticulitis, appendicitis, peptic ulcer, cancer of the colon or stomach, nonspecific diarrhea, scleroderma, Addisonian anemia, rheumatoid arthritis, systemic lupus erythematosus, idiopathic steatorrhea, hepatitis or biliary cirrhosis) The observed cytotoxic property was found to be improved 2 days and eliminated 10 days after colectomy (4 cases), or hemicolectomy (1 case). No cytotoxicity for gastric or ileal epithelial cells *in vitro* was observed with lymphocytes from 2 patients with demonstrated cytoxicity for colonic cells.

1494 **SERUM α_1-ACID GLYCOPROTEIN IN CHRONIC ULCERATIVE COLITIS.** *(E.)* Dearing, W. H. (Mayo Clin., Rochester, Minn.), W. F. McGuckin and L. R. Elveback. *Gastroenterology* 56(2):295-303, 1969.

Serum α_1-acid glycoprotein levels were studied in 31 control subjects and in 130 patients with quiescent (25 cases) or mildly (38 cases), moderately (34 cases) and severely (33 cases) active chronic ulcerative colitis (without associated liver disease). Although the mean value for the controls (80.71 mg%) differed significantly from those for patients with quiescent (95.25 mg% and mildly active (120.66 mg%) ulcerative colitis, the overlap in the distributions was large (range of values 51-111, 60-124 and 72-165 mg%, resp.). In contrast, there was excellent discrimination of the moderately (mean value = 203.76 mg%) and severely (387.00 mg%) active cases from the control or quiescen groups (with no overlap in values) and good discrimination between the moderately and severely active groups. The sedimentation rate proved to be a poor guide to the degree of activity of the ulcerative process in that considerable spread and extensive overlap in values was observed among the groups. One yr after colectomy, proctectomy or ileostomy for chronic ulcerative colitis, serum glycoprotein values declined to the normal range in 25 cases. In an additional 17 patients with chronic ulcerative colitis associated with liver disease (cholestasis and chronic hepatitis, with and without cirrhosis), serum values also reflected the degree of activity of the disease in the colon and rectum. The serum α_1-acid glycoprotein could serve as an index of activity of the inflammatory component of ulcerative colitis and might be useful as a guide to the efficacy of therapeutic procedures for this disease.

1495 **ULCERATIVE COLITIS: PSYCHIATRIC AND PSYCHOLOGICAL STUDY OF 22 PATIENTS.** *(E.)* Wijsenbeek, W. (Tel Aviv U. Med. Sch. , Israel), B. Maoz, I. Nitzan and R. Gill. *Psychiat Neurol Neurochir* 71(5):409-420, 1968.

To determine whether patients with ulcerative colitis have special personality structures and clearly defined mental characteristics, 22 patients with this disease were studied. Attention was also given to the phenomenon of syndrome shift (especially the alternation from bloody stools to headaches). There were 12 women and 10 men, 15-57 yr old; all were Jews: 16 were of Western origin, 6 of Oriental origin; 18 were married, 3 were childless, and 4 were bachelors under the age of 25. Most of the patients had suffered from their disease for 1-5 yr; 7 had the disease less than 1 yr and 4 for more than 5 yr. No specific personality structure or profile could be found; however, certain character traits were evident in more than half the subjects: verbal aggression under the facade of quiet and inhibited behavior (19); easily hurt (18); rigidity (14); tendency to depression (17), over-ambitious (15); impulsive outbursts (13); and a desire to appear healthy (16). Their general personality tended toward coarctation or introversion. Various forms of stress or conflict were found to be precipitating factors in many of the cases (conflict with a key-person). Types of syndrome shifts were found in 11 patients, but the reappearance of headaches during the remission phase was found in only 1 case. It is possible that these findings are not specific for ulcerative colitis since the examination of patients long after the onset of the illness yields insufficient and unprovable information as to the original mental structure.

1496 **THE ROLE OF PSYCHOSOMATIC FACTORS IN ULCERATIVE COLITIS.** *(Pol.)* Starzecka, B. (Infect. Dis. Clin., Acad. Med. Krakow, Poland) and B. Winid. *Folia Med Cracov* 10(3):417-429, 1968.

Observations on the behavior of 54 patients (24 males and 30 females, 15-72 yr old) under treatment for ulcerative colitis revealed a consistent tendency toward passive obedience, egocentrism and infantile dependence. The course of the disease was significantly milder in older patients (those over 30) and was aggravated by stress or excessive responsibility (executive positions in large industries). Among 30 of these patients (14 men and 16 women, all under 60) subjected to a thorough psychiatric examination, only 3 could be classed as normal; diagnoses in the other 27 included infantile personality (12 cases), hysteria (8 cases), phobia (5 cases) and habitual alcoholism (2 cases). The onset and relapses of the disease were often associated with mental and physical stress. It is concluded that a psychiatric examination is often advisable in patients with ulcerative colitis, and that mental factors should be taken into consideration in their therapeutic management.

1497 **THE SURGICAL TREATMENT OF ULCERATIVE COLITIS.** *(Fr.)* Loygue, U. (Rothschild Hosp., Paris, France), M. Malafosse and H. Ingea. *Actualites Hepatogastroent Hotel Dieu* 4(5):A262-A274, 1968.

Operations were performed on 102 patients (59 women and 43 men, aged 13-70 yr) with ulcerative colitis. Only 8 had histories dating back 10 yr or more. Four of 37 patients with prolonged or chronic subacute forms had cancer of the colon. In 16 cases the radiological findings indicated partial colonic involvement, but the entire colon was found to be affected at surgery. Initial operations consisted of 9 total coloproctectomies, 72 total or subtotal coloproctectomies combined with other procedures (ileostomy or ileorectal anastomosis), 9 partial coloproctectomies, 4 sigmoidorectal amputations, and 8 ileostomies or colostomies. Reoperations had to be performed in 57 cases. There were 14 operative deaths (12 after the 1st operation and 2 after the 2nd). Only 3 patients died of abdominal complications (2 of peritonitis and 1 of a hemorrhage) and 1 died of septicemia. The mortality was highest among patients who were 50-60 yr old (40%). Six of the 14 patients who died had been given corticosteroid therapy for 6-24 months before surgery. Nonfatal complications occurred frequently and included 21 parietal complications, 15 intraabdominal complications, 11 rectocolonic hemorrhages, 10 thromboembolisms, 6 respiratory complications, and 7 miscellaneous complications. Two long-term deaths occurred in patients with rectocolonic cancer.

1498 **SPA TREATMENT OF PATIENTS WITH NONSPECIFIC ULCERATIVE COLITIS.** *(Rus.)* Saakian, A. G. (Piatigorsk Inst. Hlth. Resorts & Physiother., USSR). *Ter Arkh* 40(10):102-105, 1968.

1499 **THE LYMPHOCYTE AND ULCERATIVE COLITIS.** *(E.)* Watson, D. W. (U. Michigan Med. Ctr., Ann Arbor). *Gastroenterology* 56(2):385-386, 1969.

1500 **A SYNDROME RESEMBLING RELAPSING POLYCHONDRITIS IN A PATIENT WITH ULCERATIVE COLITIS.** *(E.)* Rosen, S. W. (Natl. Inst. Arthr. Metab. Dis., NIH, Bethesda, Md.), M. R. MacKenzie, P. J. Cohen, S. Friedlander, W. Medart and J. B. Reardan. *Gastroenterology* 56(2):323-330, 1969.

1501 **NONSPECIFIC ULCERATIVE COLITIS IN COSTA RICA.** *(E.)* Miranda, M. (San Juan de Dios Hosp., San José, Costa Rica), J. Salas, R. A. Umana, G. Jimenez and A. Acosta. *Gastroenterology* 56(2):310-316, 1969.

1502 **HEMORRHAGIC RECTOCOLITIS AND EXOGENOUS ALLERGIC FACTORS.** *(Fr.)* Gauthier, A. (La Timone Hosp., Marseille, France) and J. Sahel. *Rev Med Toulouse* 5(1):35-41, 1969.

PANCREAS

1503 **CANCER OF THE PANCREAS.** *(E.)* Richard, L. Jr., (Louisiana State U. Sch. Med., New Orleans) and I. Cohn Jr. *Amer Surg* 35(2):95-103, 1969.

In a series of 289 patients (1-94 yr old with a male to female ratio of 1.8:1) histologically proven malignant tumors of the pancreas seen during the period 1943-1964, with symptoms, physical findings and laboratory data were analyzed in relation to the location of the tumor and the course of the illness. The most common initial and admitting symptoms for tumors in each of the 4 anatomic sites of the pancreas (head, tail, body, diffuse) were pain (174 cases) and weight loss (229 cases), resp. Jaundice occurred earlier in carcinoma of the head than in other locations; anorexia was relatively less common in carcinoma of the head than in the other 3 sites. The most commonly observed abnormal physical findings were hepatomegaly (158 cases) and abdominal tenderness (114). Jaundice was more frequent in the head (113 cases) than in the body (16 cases), tail (7 cases) or diffuse (5 cases). The gallbladder generally became palpable in the course of the disease. Roentgenographic and laboratory examinations were helpful in the over-all evaluation of patients, but did not aid in diagnosis of pancreatic cancer. Thirty to fifty percent of patients with pancreatic carcinoma in any location showed some X-ray abnormality of the stomach and/or duodenum. Glycosuria was present in 8% of patients, and elevated blood glucose levels occurred in 14%. Serum bilirubin was elevated in 92 and 48-58% of those tested with cancer of the head and cancer of other locations, resp. A correct diagnosis was made before surgery or atuopsy in 72% of cases involving the head, 40% of carcinomas of the tail and 35% of patients with diffuse carcinoma or carcinoma of the body. For all 4 anatomic sites, the regional nodes and liver were the most common sites of metastasis. Adrenals and spleen were involved more frequently than is usually considered (59 cases). Forty-five radical pancreaticoduodenectomies were performed among 207 operations; 5 survived more than 3 yr and 2 more than 10 yr. Other diseases were associated with pancreatic carcinoma in 23% of the cases: cholelithiasis in 25, choledocholithiasis in 4, chronic pancreatitis in 5 and thrombophlebitis in 9 patients. This study did not reveal any distinctive criteria which could be used to distinguish among the 4 anatomic types of pancreatic carcinoma.

1504 **EXPERIMENTAL ALLOTRANSPLANTATION OF THE PRESERVED PANCREAS AND DUODENUM.** *(E.)* Idezuki, Y. (U. Minnesota Med. Sch., Minneapolis), F. C. Goetz and R. C. Lillehei. *Surgery* 65(3):485-493, 1969.

Intraabdominal heterotopic pancreaticoduodenal (P-D allotransplantation was performed in 29 pancreatectomized dogs using P-D grafts preserved *in vitro* at 2-4C and 4 atmospheres absolute of pure oxygen (ATA) for periods up to 48 hr. Immunosuppressive measures, including azathiopurine, steroids, and antilymphocytic serum, were used to prevent rejection. Sixteen of the 18 grafts preserved for up to 22 hr functioned after allotransplantation in the recipient; 11 of these grafts sustained the recipient's life for more than 10 days, the longest survival being 169 days. Five of the 9 23-24 hr grafts also functioned after transfer to the recipient, with 2 of the recipients surviving for 17 and 24 days, resp. All attempts to transplant 48-hr preserved grafts were failures. The endocrine function of the P-D grafts, assessed by fasting blood glucose, circulating plasma insulin, and glucose tolerance tests, showed that varying degrees of ischemic damage occurred during the preservation period bu was reversible with preservation periods of 24 hr or less. It is concluded that canine P-D grafts can be preserved in viable form for up to 24 hr by the use of hypothermia and hyperbari and can sustain the life of the pancreatectomized dog.

1505 **ACCESSORY PANCREAS: REPORT OF FOUR CASES.** *(Pol.)* Pichurski, R. (Distr. Hosp., Opole, Poland), K. Kirylowicz and J. Hause. *Pol Przegl Chir* 41(1):74-76, 1969.

Brief case reports are presented for 4 patients (males, 31-60 yr old) who were subjected to surgery for gastroduodenal ulcers and found at laparotomy to have an accessory pancreas. The pancreatic tissue was in the form of a small nodule in the wall of the duodenum, jejunum or pylorus. Its removal was followe by complete alleviation of symptoms in all 4 cases. Based on this experience, it is pointed out that an accessory pancreas may be the site of a neoplasm, bleeding, necrosis or an inflammatory lesion, or the cause of gastrointestinal obstruction, intu susception, obstructive jaundice, or sudden pain due to reflex spasm of the gastric mucosa or intestinal wall.

1506 **PANCREATIC PSEUDOCYSTS: ANALYSIS OF 41 CASES AND THERAPEUTIC DEDUCTIONS.** *(Fr.)* Adloff, M. (U. Hosp. Ctr., Strasbourg, France), J. J. Kohler and P. Wong. *Ann Chir* 22(23/24):1357-1367, 1968.

Among 41 patients (34 males and 7 females, 8-71 yr old but most between 30 and 50) treated for pancreatic pseudocysts during a 10-yr period, 18 had acute pancreatitis, 17 had chroni pancreatitis, and 3 children developed pseudocysts after abdominal trauma; in the other 3 cases the etiology was unknow The volume of the pseudocysts varied from 0.5 to 3.5 liters, and 29 were located in the body of the pancreas. Symptoms included pain in 36 cases, anorexia in 20, and a palpable mass in 28. Treatment was by internal drainage (cystogastrostomy, cystoduodenostomy or cystojejunostomy) in 29 cases, external drainage in 7, and excision in 3, while in 2 cases there was spontaneous evacuation. All but 4 patients who developed complications responded favorably to surgical treatment. It is concluded that internal drainage, which should be generous and must be downward, is the procedure of choice in these cases. External drainage should be undertaken only when the walls of the pseudocyst do not permit a safe anastomosis and when the general condition of the patient demands immediate surgery. Excision should be avoided whenever possible and is useful only in the case of pseudocysts in the tail of the pancreas.

1507 **ENDOCRINE FUNCTION OF PANCREATIC HOMOTRANSPLANTS IN DOGS: THE EFFEC OF IMMUNOSUPPRESSIVE THERAPY.** *(E.)* Huguet, C. (St. Antoine Hosp., U. Paris, France), P. Daloze, L. Orcel and K. E. Sussman. *Arch Surg* 98(3):375-380, 1969.

ıncreatic homotransplants were performed in pancreatecto-
ized dogs divided into 3 groups: 1) heterotopic partial pan-
eatic homotransplants in 8 dogs without immunosuppressive
ıerapy, 2) partial homotransplants in 12 dogs receiving im-
unosuppressive therapy and 3) orthotopic total duodeno-
ıncreatic homotransplants in 9 dogs receiving immunosuppres-
ve therapy. Functional evaluation was based on blood glu-
ose and plasma insulin levels (fasting values and stimulatory
sts). The transplants were able to achieve normal blood glu-
ose levels for periods up to 42 days. The early endocrine
ınction, before the onset of rejection, was normal in both
ırtial and total transplants. The progressive deterioration of
ndocrine function as detected by tolbutamide stimulation was
ound to be an earlier sign of rejection than the change in fast-
g blood glucose or plasma insulin levels. Immunosuppressive
ıerapy consisting of antilymphocyte globulin, azathioprine,
nd steroids produced only limited survivals, averaging 19.2
ays in the partial homotransplants. Because of the frequency
f ulcerative duodenitis, duodenopancreatic transplantation
oes not appear to be the optimal procedure for studying pan-
reatic rejection.

508 **IMPAIRMENT OF GROWTH AND PANCREATIC HYPERTROPHY IN RATS FED TRYPSIN**
NHIBITOR FROM RAW PEANUTS. *(E.)* Kwaan, H. C. (VA
Res. Hosp., Chicago, Ill.), P. Kok and T. Astrup. *Experientia*
4(11):1125-1126, 1968.

509 **STENOSIS OF THE HEPATIC ARTERY WITH A LATE-DEVELOPING ABDOMINAL MURMUR**
AS SYMPTOMS OF PANCREATIC CANCER. *(Fr.)* Linquette,
M. (Med. Clin. East, Lille, France), G. Lagache, G. Luez, C.
L'Herminé, M. Vankemmel and J. C. Fourlinnie. *Lille Med*
3(8):880-883, 1968.

1510 **SUCCESSFUL TWENTY-FOUR HOUR PRESERVATION OF PANCREATICODUODENAL ALLOGRAFT WITH HYPOTHERMIA AND HYPERBARIC OXYGEN.** *(E.)* Idezuki, Y. (U. Minnesota Med. Sch., Minneapolis), R. H. Dietzman, J. A. Feemster, R. A. Ersek and R. C. Lillehei. *Surg Forum* 19:221-222, 1968.

1511 **AN ADDITIONAL CASE OF ANNULAR PANCREAS WITH A REVIEW OF THE 31 CASES REPORTED IN JAPAN.** *(E.)* Komi, N. (Tokyo Med. Dent. U., Japan), I. Yamaoka, Y. Sato and K. Toyama. *Bull Tokyo Med Dent Univ* 15(2):91-98, 1968.

1512 **CLINICAL PICTURE OF THE ABERRANT PANCREAS. [CASE REPORT]** *(E.)* Kröhl, R. (1st Dept. Med., U. Frankfurt, Germany) and H. Kasperat. *German Med Monthly* 13(12):585-586, 1968.

1513 **ISOLATED TRAUMATIC RUPTURE OF THE PANCREAS.** *(Pol.)* Pardela, M. (1st Surg. Clin., Silesian Acad. Med., Zabrze, Poland), J. Zys and I. Wojakowski. *Pol Tyg Lek* 23(45):1734-1735, 1968.

1514 **CUSHING'S SYNDROME ASSOCIATED WITH CARCINOMA OF PANCREAS. [CASE REPORT]** *(E.)* Khan, A. (Ruchill Hosp., Glasgow, Scotland). *Postgrad Med J* 44(518):925-926, 1968.

1515 **CYSTADENOMA OF THE UNCINATE PROCESS OF THE PANCREAS. [CASE REPORT]** *(E.)* Rustomjee, P. F. (Gen. Hosp., Galle, Ceylon). *Ceylon Med J* 13(2):95-97, 1968.

See also: 1220,1229,1233,1241,1257,1469

1516 **ON ETIOLOGY AND PATHOPHYSIOLOGY OF ACUTE PANCREATITIS, WITH SPECIAL REFERENCE TO PARTICIPATION OF PHOSPHOLIPASE A.** *(E.)* Hatao, M. (Med. Sch., Kyoto U., Japan). *Arch Jap Chir* 38(1):76-106, 1969.

The activity and characteristics of phospholipase A, an enzyme found in high concentrations in the pancreas, was studied in dogs with experimental acute pancreatitis. The phospholipase A activity of the pancreas was high even in the normal dog, and increased during acute pancreatitis in the pancreas, liver, portal blood, peripheral blood and peritoneal fluid. A correlation was observed between early death of the animals and early rises in phospholipase A activity in the liver and portal blood. Infusions of phospholipase A into the portal or femoral vein caused transient systemic hypotension with death occurring after 20 hr in the former and survival in the latter group. Marked changes in the liver were noted in the autopsied dogs. Infusion into the retroperitoneal space resulted in the death of 2 of 3 dogs within 20 hr; only mild histological changes were noted in the pancreas and liver. It is concluded that phospholipase A is at least as important as trypsin in the pathophysiology of acute pancreatitis, with a high rate of mortality once the enzyme emigrates from the pancreas into the portal circulation, or once infiltration into the retroperitoneal space occurs.

1517 **HYPERPARATHYROIDISM ASSOCIATED WITH CHRONIC PANCREATITIS IN A FAMILY.** *(E.)* Carey, M. C. (Dept. Med. Ther., U. Coll., Dublin, Ireland) and O. Fitzgerald. *Gut* 9(6):700-703, 1968.

A 5-generation family with hereditary hyperparathyroidism and relapsing chronic pancreatitis is reported. Four female siblings (46-54 yr old) were found to have serum calcium levels of 11.0 mg% or more; chronic pancreatitis was definitely present in 3 of these sisters and suspected in the other. Pancreatitis was also suspected in an alcoholic brother who had normal serum calcium, in the mother and maternal grandmother (neither of whom were examined), and in 3 of the 6 children of 2 of the sisters with definite pancreatitis. There was no pancreatitis in the children or grandchildren of the sister with suspected pancreatitis, and another brother and 2 sisters were either normal or died without having been examined. Significant lysine-cystine aminoaciduria was observed in all 4 sisters; this may have been related to hypercalcemic renal damage as indicated by impaired glomerular filtration rate (2 cases), or could represent the independent coexistence of an incompletely recessive form of lysine-cystinuria. Neck exploration revealed a parathyroid adenoma in 1 patient and normal parathyroids in another; parathyroidectomy and subtotal resection, resp. caused a dramatic fall in serum calcium levels. The remaining 2 sisters refused further study or surgery. Goiter was found in 1 of these patients; among other family members goiter developed in 2 and hyperthyroidism in 1, suggesting the possibility of hereditary endocrine adenomatosis in this family as well. No evidence of severe pancreatic endocrine or exocrine insufficiency or pancreatic calcification was found in this series of patients.

1518 **REASONS FOR THE FORMATION OF A PERITONEAL EXUDATE DURING PANCREATITIS.** *(Rus.)* Kochnev, O. S. (Kazan Med. Inst., USSR). *Pat Fiziol Eksp Ter* 12(6):65-66, 1968.

1519 **NONDIGESTIVE SYMPTOMS OF PANCREATI- TIS.** *(Fr.)* Leymarios, J. *Concours Med* 90(47): 7921-7934, 1968.

1520 **PANCREATIC DENERVATION BY THE METHOD OF YOSHIOKA AND WAKABAYASHI IN THE THERAPY OF CHRONIC AND RECURRENT PANCREATITIS.** *(It.)* Serra, P. *Chir Gastroent* 2(4):482-491, 1968.

1521 **ACUTE PANCREATITIS COMPLICATING ABDOMINAL SURGERY.** *(Pol.)* Panecka, A. (Acad. Med., Lublin, Poland), M. Litwin and A. Pozarowski. *Pol Przegl Chir* 50(1):39-44, 1969.

1522 **THE TRANSUMBILICAL INJECTION OF TRASYLOL IN THE COMPLEX TREATMENT OF ACUTE DESTRUCTIVE PANCREATITIS.** *(Rus.)* Volobuiev, N. N. (Crimean Med. Inst., Simferopol, USSR), N. G. Nazarevskii and V. D. Sidorenko. *Sovet Med* 31(12): 30-33, 1968.

1523 **TREATMENT OF ACUTE PANCREATITIS.** *(Ger.)* Kasper, H. (Med. Clin., Justus Liebig U., Giessen, Germany) and K. Schultis. *Med Welt* 20(8):425-427, 1969.

1524 **THE USE OF THE MONOAMINOXIDASE INHIBITOR VETRAZINE IN THE TREATMENT OF ACUTE PANCREATITIS.** *(Rus.)* Akzhigitov, G. N. (1st Moscow Med. Inst., USSR). *Ter Arkh* 40(10):82-84, 1968.

1525 **THE STUDY OF ANTIPANCREATIC ANTIBODIES BY THE METHOD OF ANTIGLOBULIN FIXATION IN ACUTE AND CHRONIC PANCREATITIS.** *(Rus.)* Bugrimov, V. G. (S. M. Kirov Acad. Milit. Med., Leningrad, USSR). *Ter Arkh* 40(10):85-87, 1968.

1526 **THE TITER OF FREE AND BOUND BLOOD INSULIN IN VARIOUS FORMS OF CHRONIC PANCREATITIS.** *(Rus.)* Rafal'skii, Ia. D. (Leningrad Inst. Sanit. Hyg. Med., USSR). *Ter Arkh* 40(10):87-90, 1968.

1527 **PANCREATITIS–A COMPLICATED CASE WITH FATAL OUTCOME.** *(E.)* Williamson, R. C. N. (St. Bartholomew's Hosp., London, England). *St Bartholomew Hosp J* 73(2):61-66, 1969.

1528 **ALCOHOL, PANCREATIC SECRETION, AND PANCREATITIS.** *(E.)* Kalant, H. (Dept. Pharmacol. U. Toronto, Canada). *Gastroenterology* 56(2):380 384, 1969.

1529 **BIOPHYSICAL CHARACTERISTICS OF LUNG IN ACUTE PANCREATITIS.** *(E.)* Bolooki, H. (U. Miami Sch. Med., Fla.), K. Mobin-Uddin, C. R. Lombardo J. R. Jude and M. E. Smith. *Surg Forum* 19:371-373, 1968.

1530 EFFECT OF SYMPATHECTOMY ON HEMORRHAGIC PANCREATITIS AND ITS HEMODYNAMIC CHANGES. *(E.)* Williams, L. F. Jr. (Boston City Hosp., Mass.), C. J. Ashworth, E. H. Healey and J. J. Byrne. *Surg Forum* 19:366-368, 1968.

1531 ACUTE EDEMATOUS PANCREATITIS: METABOLIC AND HEMODYNAMIC STUDIES. *(E.)* Hermreck, A. S. (U. Kansas Sch. Med., Kansas City), E. I. Smith and A. P. Thal. *Surg Forum* 19:368-370, 1968.

1532 PANCREATIC NECROSIS. *(Fr.)* Maillet, P. and P. Bérard. *Mem Acad Chir (Paris)* 94(27/28): 823-828, 1968.

See also: 1112

LIVER AND BILIARY TRACT
GENERAL

1533 **EXPERIMENTAL CHOLANGITIS AND CHOLELITHIASIS.** *(E.)* Chou, S. T. (Dept. Path., U. Hong Kong) and J. B. Gibson. *Brit J Exp Path* 49(6):565-573, 1968.

Cholangitis was produced in Wistar rats and rabbits by ligation of the common bile duct, without severance, and inoculation of *E. coli* (1.5 x 10^6 organisms in 0.1 ml suspension/0.1-1.0 kg body weight) into the portal circulation. Suppuration of portal tracts and cholangitis were demonstrated as early as 24 hr after surgery in the rabbits, and all animals died early (within 3 days). In rats, exudative cholangitis occurred within 4 days; portal tract suppuration was not observed, but intrasinusoidal infiltration of polymorphs and proliferation of Kupffer cells preceded the appearance of cholangitis. Two months later, all rats showed recanalization of the common bile duct. The lesions which developed in both rats and rabbits resembled human recurrent pyogenic cholangitis, but the course of the condition was relatively static in rats: portal tracts were less deranged than in human cholangitis and recurrent abscesses or fibrous collars around the bile ducts did not occur in rats during 6 months of observation. These findings support the view that recurrent pyogenic cholangitis in man results from portal bacteremia and is not an ascending infection. Earthy stones resembling the intrahepatic stones in human cholangitis were found consistently in the commone bile ducts of rats in the later stages of the experiments (after 3 months). Stones did not form in control animals subjected to either biliary obstruction or injection of *E. coli* into the portal circulation alone, indicating that both obstruction and infection are required for stone formation. It is postulated that in the presence of obstruction, the failure to eliminate bacteria through the bile duct damages the epithelium sufficiently to cause stone formation.

1534 **CLINICAL AND MORPHOLOGICAL COMPARISONS OF DRUG-INDUCED TOXICO-ALLERGIC AND EPIDEMIC HEPATITIS.** *(Rus.)* Semendiaieva, M. Ie. (64th Munic. Clin. Hosp., Moscow, USSR), L. B. Rozanova, G. B. Lapkina and B. K. Bezprozvannyi. *Sovet Med* 31(12):9-16, 1968.

Among a large number of patients under treatment for "viral hepatitis," 123 were selected for special study because of a history of receiving possibly hepatotoxic drugs; these included 56 who had been given p-aminosalicylic acid or other antitubercular drugs, 31 treated with chlorpromazine or other phenothiazines, 14 who had received various antibiotics, 7 who had been given anabolic steroids, and 8 who had received pyrazolone derivatives. A comparison of the clinical and laboratory findings in these patients with those in viral hepatitis revealed that the duration of both the preicteric and icteric periods as well as the degree of hyperbilirubinemia and the elevation of SGOT and aldolase levels were significantly greater in viral hepatitis, while the severity of allergic symptoms and the increase in alkaline phosphatase were significantly greater in drug-induced hepatitis. Polarographic determinations of urinary fructose excretion were also found to be of value for differential diagnosis, since urinary fructose is increased in viral hepatitis. Liver biopsy studies revealed 3 stages in the development of toxic hepatitis: from disturbances of a general nature affecting first only the liver cell nuclei and later the entire cell, through hepatitis-like immune reactions, with or without parenchymal involvement and with the eventual development of centrilobular cholestasis, to the final stage of cholangiolitic hepatitis. The differential diagnosis of viral and drug-induced hepatitis is particularly difficult in the 2nd stage, especially since the different drugs may have different metabolic effects. In general, however, parenchymal infiltration is less marked and less widespread and the dystrophic changes are more uniform in the drug-induced type; furthermore, toxic hepatitis is characterized by dilatation of elements of the Golgi apparatus and accumulation of bile with the formation of myelin-like structure. These differences are ascribed to the fact that the hepatic dystrophy in viral hepatitis and toxic hepatitis depends on disruption of protein synthesis and energy metabolism, resp. Another valuable diagnostic technique was found to be immunofluorescence of liver smears, since intense fluorescence of the hepatocellular and mesenchymal cytoplasm was noted only in the presence of immunologically-active drug-induced hepatitis. However, since some specimens also showed fluorescence with γ-globulin, which is considered to be specific for viral hepatitis, it is clear that mixed forms also exist. The possibility remains that the principal effect of any hepatotoxic drug may be to activate a latent form of viral hepatitis.

1535 **THE SIGNIFICANCE OF AUTOIMMUNITY FOR THE DEVELOPMENT OF CHRONIC HEPATOBILIARY LESIONS.** *(E.)* Hořejši, J. (Inst. Hematol., Prague, Czechoslovakia), Z. Ježková, M. Láznička, Z. Vahala and V. Švorcová. *T Gastroent* 11(5):501-511, 1968.

Using the complement consumption test, antibodies against liver tissue were detected in 8% of control subjects without signs of hepatic disease, in 1% of healthy blood donors, and in 60% of patients with acute infectious hepatitis. Positive results were found more often in jaundiced (58%) than in nonjaundiced (13%) cases. The incidence of positive reactions decreased rapidly during the course of recovery (24% within 2-6 yr and 15% after more than 6 yr). When the presence of autoantibodies was assayed in another series of recovered patients using a complex of several antigens (aqueous extracts from liver, bile ducts, gallbladder and components of bile), positive results occurred in 66% of patients with positive laboratory findings and negative clinical history, and in 30% of cases with normal clinical and biochemical findings. In cholelithiasis associated with chronic cholecystitis, but with no history of previous viral hepatitis and with negative liver function tests, positive results were obtained with the panel of antigens in 59%. Immunofluorescent reactions in the liver parenchyma were positive in 88% of cases with IgG antisera, 44% with IgA antisera, and 55% with IgM antisera. Immunoelectrophoresis detected elevation of serum IgG, IgA and IgM in 35, 47 and 12% of cases, resp. These observations suggest the formation of antigen (represented by degradation products of infection in the gallbladder and bile ducts) and interaction with antibody in liver tissue.

1536 **INTRAHEPATIC ABSCESS.** *(E.)* Rambo, W. M. (Med. Coll. South Carolina, Charleston) and H. C. Black. *Amer Surg* 35(2):144-148, 1969.

Twenty-two patients (15 males and 7 females, 3-72 yr old) treated for intrahepatic abscesses during the period 1956-67 are reviewed. The most frequent symptoms were anorexia (19 patients), malaise (17), right upper quadrant pain (17), nausea and vomiting (11), weight loss (10), generalized abdominal pain (10), and chills and fever (9). The most frequent physical signs included fever (19 cases), right upper quadrant tenderness (15), jaundice (12), and hepatomegaly (11). Leukocytosis, elevated serum bilirubin and low serum albumin levels were usually observed. Abdominal X-ray in 16 of 22 patients revealed an inflammatory process in the right upper quadrant. Liver scanning with ^{198}Au permitted correct preoperative diagnosis in 3 of 5 patients, whereas a correct preoperative or premortem diagnosis was obtained in only 1 of 15 patients who did not have liver scanning. One amebic abscess and only 1 pyogenic abscess attributable to appendicitis were found. Biliary tract disease, either cholecystitis (4 cases) or cholangitis secondary to obstruction of the common bile duct (3 cases), was the most common predisposing factor in 21 cases of pyogenic abscess. Positive bacterial cultures were obtained in 13 of these 21 patients, 10 showing enteric organisms and 3 showing *Staphylococcus aureus* or *epidermidis*, or diphtheroids. Six of 19 patients treated surgically (drainage, excision, marsupialization, choledochostomy) died. The most effective preventive measures against intrahepatic abscess are early and adequate surgical and antibiotic therapy of intraabdominal sepsis. Amebic liver abscess may respond to chloroquine and emetine with needle aspiration of the abscess cavity.

1537 **DEFICIENCY OF ERYTHROCYTE G-6-PD AS A CAUSE OF NEONATAL JAUNDICE IN INDIA.** *(E.)* Deshmukh, V. V. (Med. Coll., Aurangabad, India) and K. D. Sharma. *Indian Pediat* 5(9):401-405, 1968.

Among random cord blood samples taken from 100 children (55 males, 45 females) born at the Medical College Hospital, Aurangabad over a period of 1 yr, 6% (5 males, 1 female) were found to be deficient in glucose-6-phosphate dehydrogenase (G-6-PD) on the basis of the methemoglobin reduction test. Two intermediate males and 4 intermediate females were detected; these findings are strongly suggestive of genetic heterogeneity for G-6-PD deficiency in the Indian population. Neonatal jaundice occurred in 3 of the 100 children, but in only one case was it ascribable to G-6-PD deficiency. The mother's blood in this case showed only a trace of G-6-PD activity. The occurrence of jaundice in 1 of 6 children with G-6-PD deficiency (16.6%) compares favorably with the incidence reported for a series of Nigerian children, and confirms the findings from many other countries that G-6-PD ranks next to erythroblastosis fetalis as a cause of neonatal jaundice.

1538 **THE ACTION OF ASPARTIC ACID ON PROTEIN SYNTHESIS IN CHRONIC HEPATITIS.** *(E.)* Fodor, O. (3rd Med. Clin., Cluj, Romania), I. Szántay and S. Cotul. *Rev Roum Med Intern* 5(6):387-393, 1968.

The method of determining the half-life of ^{75}Se-selenomethionine and the rate of its incorporation into plasma proteins was used to study the effect of aspartic acid on protein synthesis in 22 patients with chronic active hepatitis and 15 normal controls. Prior to aspartic acid administration, ^{75}Se-selenomethionine had a longer half-life in the blood and plasma of hepatitis patients than in controls. Following aspartic acid administration, a statistically significant improvement in the half-life was noted. This indicates a favorable action of aspartic acid in proteinogenesis and justifies its administration, along with other hepatotropic substances, to patients with chronic hepatitis.

1539 **LIVER BLOOD FLOW STUDIES DURING AND AFTER VARIOUS PERIODS OF TOTAL BILIARY OBSTRUCTION IN THE DOG.** *(E.)* Aronsen, K. F. (Malmö Gen. Hosp., Sweden), G. Nylander and E. G. Ohlsson. *Acta Chir Scand* 135(1):55-59, 1969.

The effective liver blood flow during biliary stasis of varying duration and following operative release of the biliary obstruction was estimated in 28 dogs using radioactive colloidal gold. During the first week of biliary stasis the plasma clearance of ^{198}Au (K_{Au}) increased. On the 14th and 21st days of total biliary obstruction the K_{Au} values were decreased, falling significantly below the preoperative level by the end of the 3rd week. Release of biliary stasis of 3, 7 and 14 days duration resulted in recovery of the liver blood flow to its preoperative level within 7-14 days. However, in dogs subjected to biliary stasis for 21 days, K_{Au} was decreased throughout the observation period of 6 months (up to 21 months in 1 dog) after release of the obstruction, suggesting an irreversible reduction of effective liver blood flow. SGPT activities reached a maximum on the 7th day of stasis, decreasing thereafter, and also following release of the obstruction. Plasma BSP clearance was low during biliary stasis but returned to preoperative levels within 7-14 days after reoperation in dogs with biliary stasis for 3, 7 or 14 days. It was retarded for 6 months in animals subjected to 21 days of stasis. Extraction of BSP from the liver was decreased immediately after release of the biliary obstruction in the 14- and 21-day groups, but was normal or increased during the remainder of the observation period in the 21-day animals.

1540 **CROSS CIRCULATION OF PATIENTS IN HEPATIC COMA WITH BABOON PARTNERS HAVING HUMAN BLOOD.** *(E.)* Hume, D. M. (Med. Coll. Virginia Div., Va. Commonwealth U., Richmond), W. E. Gayle Jr. and G. M. Williams. *Surg Gynec Obstet* 128(3):495-517, 1969.

The clinical and immunological consequences of cross circulation of 4 patients in hepatic coma with baboon partners *(Papio anubis)* which had previously undergone total exchange transfusion with human blood are presented. The only adverse patient reactions during the 11.5-hr procedure were hypotension in 1 patient, depressed renal function in 1 patient, and thrombocytopenia in 2 patients. Two of the 4 patients awoke from coma (1 was discharged from the hospital), while a 3rd became slightly more responsive. The bilirubin value fell in 3 of the 4 patients, and the creatinine level fell in 2 of 3 in whom it was elevated. The baboon partner excreted over 2000 cc urine during cross circulation in 3 of 4 cases, and in 2 of 3 patients, improvement in the degree of ascites was noted. Hypotension was corrected in 1 of 2, and 1 of 3 patients showed a striking, although temporary, improvement in renal function. The principal difficulty of the technique was the sudden death of baboons during cross circulation, apparently a form of hyperacute rejection related to ABO blood group incompatibilities; this did not occur when the ABO type of the baboon and that of the patient were compatible. Both heterologous anti-baboon and isologous ABO antibodies were detected in the patients and were demonstrated to react with baboon cellular antigens. Significant hemolysis was noted during heterologous cross perfusion; this did not coincide with the destruction by the baboon of its human red cells, which usually took place 6 days after exchange transfusion, but may be related to heterologous antibodies. This phenomenon did not seem detrimental to the patients. The 4 patients lived 1, 3, 10, and 22 days after cross circulation.

1541 SURVIVAL AND METABOLISM IN EXPERIMENTAL ENDOGENOUS HEPATIC COMA.

(E.) Mattson, W. J. Jr. (U. Michigan Med. Ctr., Ann Arbor) and J. G. Turcotte. *Surg Gynec Obstet* 128(3):557-564, 1969.

Hepatic coma was induced in dogs by a 2-stage method of hepatic ischemia: the creation of a portacaval shunt followed in 24 (35 dogs), 48 (6 dogs), or 96 hr (8 dogs) by ligation of the common hepatic artery. The time of onset of coma, duration of survival, and the clinical signs of coma were noted. Histological sections of the liver were studied in all cases shortly after death. In 4 of 6 long-term survivors in the 96-hr group, the Eck fistula was excised and portal circulation was reestablished by anastomosis of the severed portal vein 6-8 weeks after hepatic artery ligation. Six dogs died shortly after the portacaval shunt was established and 5 died within 10 hr after hepatic artery ligation. Of the dogs remaining, nearly all dogs in the 24-hr group died in coma with an average survival of 24 hr. When the time interval between shunt and ligation was increased to 48 and 96 hr, the percentage of dogs becoming comatose and dying decreased. Dogs became ataxic, weak and obtunded with widely dilated pupils as coma progressed, and bizarre posturing and vomiting occurred as coma deepened. The time of onset of coma depended on the interval between shunt and ligation. With a 24-hr interval, coma appeared 4-18 hr after ligation; with a 48-hr interval, coma began in 16-28 hr and with a 96-hr interval, only 25% of dogs went into coma. The major pathological changes were limited to the liver which appeared blanched with darkly mottled patches. Histologically, the liver showed varying degrees of centrolobular necrosis with sparing of the cellular architecture in the periportal areas; dogs surviving the longest showed the greatest degree of necrosis. Livers from dogs which did not become comatose showed the typical changes seen in Eck-fistula preparations. In dogs that progressed to coma, progressive elevations in the arterial blood ammonia, pH, blood urea nitrogen, lactate and pyruvate were noted. Serum transaminase and alkaline phosphatase levels increased and reached a peak 12 hr after hepatic artery ligation. The acid-base derangement was noted to be a partially compensated respiratory alkalosis. In dogs that had reestablishment of the portal circulation, a gradual return to pre-shunt weight was noted, and a complete resolution of the cellular atrophy and fatty infiltration of the liver was seen; no cirrhotic changes were noted. This model is potentially useful to study the effectiveness of various methods of treatment for hepatic coma and the metabolic changes which occur in blood, brain, and other tissues during hepatic coma.

1542 TREATMENT OF CHRONIC NONALCOHOLIC LIVER DISEASES WITH A COMBINATION OF AZATHIOPRINE AND PREDNISONE: PRELIMINARY REPORT. *(Fr.)* de Groote, J. (St. Raphael Acad. Hosp., Louvain, Belgium), J. Vandenbroucke and H. Maes. *Acta Gastroent Belg* 31(11):786-790, 1968.

Treatment of 19 patients with chronic aggressive hepatitis, nonalcoholic cirrhosis, or biliary cirrhosis was begun with 15-20 mg/day of prednisone and 50 mg/day of azathioprine. These dosages were used for 2 months until serum transaminase levels decreased. If patients did not respond to therapy the dose of azathioprine was increased by 25 mg every 2 months until a dose of 100 mg/day was reached. In almost all cases serum transaminase levels decreased rapidly. In some cases this was followed by decreases in γ-globulin levels and normalization of flocculation tests. Reductions in immunoglobulin G levels were also noted. In patients on whom liver biopsies were done before and after therapy, parenchymal lesions had stabilized or disappeared. Two patients, treated with prednisone alone, did not respond as well. One patient with cirrhosis developed leukopenia so that azathioprine therapy was discontinued. Two others developed septicemia (cultures consisted primarily of *Streptococcus viridans*) and a prostate abscess, resp. The former responded to antibiotic therapy while the latter died of liver failure during surgery for the abscess. Although short-term results of prednisone and azathioprine therapy are encouraging, long-term results are not yet available.

1543 CHANGES IN ENZYMATIC ACTIVITY PRODUCED BY TREATMENT WITH LYOPHILIZED LIVER. *(Fr.)* Cachin, M. (Cochin Hosp., Paris, France), F. Pergola, A. Charbonnier, Y. Thuillier and R. Wegmann. *Sem Ther* 44(10):627-632, 1968.

Histochemical studies were made on liver tissue obtained by punch biopsy from 6 patients (1 with cholestatic hepatitis, 2 with steatosis associated with sclerosis, 2 with cirrhosis, and 1 with cholestasis and sclerosis secondary to pancreatic cancer), all of whom were treated with 250 g/day of Rolland's lyophilized liver for 12-30 days. Before treatment, transaminase and alkaline phosphatase activities were high in cholestasis associated with hepatitis and pancreatic cancer. In steatosis a correlation was observed between the extent of inhibition of protein synthesis and alanyl peptidase, leucyl peptidase, and choline oxidase activities and the excess of triglyceride. Increased cholinesterase activities in cirrhosis suggested the possibility of parenchymal regeneration. Treatment with lyophilized liver tended to improve results of biological tests and liver enzyme activities. Treatment had a favorable effect on protein and nucleic acid metabolism and stimulated nucleotidase production. A reduction in lipid synthesis and an increase in lipid degradation was seen in steatosis.

1544 ATTEMPTS AT THE SURGICAL TREATMENT OF INTRAHEPATIC BILIARY ATRESIA IN THE PRESENCE OF A PERMEABLE EXTRAHEPATIC BILIARY TRACT: STUDY OF 14 OBSERVATIONS ON CHILDREN. *(Fr.)* Alagille, D. (Parrot Hosp., Bicetre, France), J. Borde, E. C. Habib and N. Thomassin. *Arch Franc Pediat* 26(1):51-71, 1969.

Of 26 children with partial or total atresia of the intrahepatic biliary tract, 18 had permeable extrahepatic biliary tracts. Of these, 14 had bile drained externally at least once. Good long-term results were obtained in only 1 case. The most common complication of external bile drainage was biliary tract infection which developed in 9 of 19 drainages. Four of these patients died of cholangitis or septicemia, 1 of them 5 weeks after surgery in endotoxin shock. MacLagan's flocculation test, which was positive in only 2 cases before surgery, became positive in 8 during or somewhat after drainage. Other complications included episodes of jaundice, cholestasis, decoloration of the stools, ascites, meteorism, and paralytic ileus and melena. Anastomoses were made between the common bile duct and jejunum in 5 cases and between the common bile duct and duodenum in 1. The size of the liver decreased in 3 cases, stools took on a normal color in 2, pruritus improved in 5 and completely disappeared in 4 with cholestyramine therapy, xanthoma disappeared in 2 cases, and the rate of growth increased in 2 children with signs of dwarfism. Blood lipid and cholesterol levels decreased greatly in 4 cases and to a lesser extent in 1 other. One patient with a cholecystoduodenostomy developed biliary septicemia and died 1 yr later of liver failure and portal cirrhosis. It is concluded that cholecystojejunostomy is the best surgical method for draining the bile in children.

1545 **BILIARY SURGERY FOR PROLONGED CHOLESTASIS IN INFANTS: SURGICAL FINDINGS IN 128 CASES.** *(Fr.)* Alagille, D. (Parrot Hosp., Bicetre, France), J. Borde, E. C. Habib and J. P. Dommergues. *Arch Franc Pediat* 26(1):37-49, 1969.

Exploratory surgery performed on 128 infants (less than 3 months old) with prolonged cholestatic jaundice showed that 107 had anomalies of the extrahepatic biliary tract (96 with atresia and 11 with pseudocysts of the common bile duct) and 21 had permeable extrahepatic biliary tracts (12 with neonatal hepatitis, 8 with isolated atresia of the intrahepatic biliary tract, and 1 undiagnosed case). The liver was abnormally lobulated in 19 infants with extrahepatic obstructions, in 2 with intrahepatic biliary atresia, and in none of the patients with neonatal hepatitis. Lymph nodes were present in the hepatic pedicle of 10 of the 107 patients with extrahepatic biliary obstructions and in 1 with intrahepatic biliary atresia. Vascular anomalies of the hepatic pedicle were found in 19 patients with extrahepatic obstructions but in none of those with intrahepatic obstructions or hepatitis. These anomalies involved the hepatic artery (8 cases), cystic artery (2 cases), or portal vein (3 cases). Of the 96 patients with extrahepatic biliary obstructions 48 had more or less complete absence of some or all of the extrahepatic biliary tract. Three other types of anomalies occurred in 14-16%: 1) atresia of the hepatic ducts with permeable cystic and common bile ducts; 2) atresia of the hepatic, cystic, and common bile ducts; and 3) alternating atretic and permeable bile ducts. Only 6% had atresia of the common bile duct, cystic duct, and terminal part of the hepatic duct with dilatation of the proximal hilum of at least one of the hepatic ducts which communicated with the intrahepatic biliary tract.

1546 **EXPERIMENTAL TOTAL HEPATECTOMY.** *(Sp.)* Ferre, J. (Med. Coll. Virginia, Richmond) and H. J. O. White. *An Hosp S Cruz S Pablo* 28(5):355-362, 1968.

Modifications of the hepatectomy techniques of Firor and Stinson and of Starzl were developed on dogs in which the liver and intrahepatic vena cava were removed after a side-to-side portacaval anastomosis; the continuity of the vena cava was reestablished with a vascular prosthesis of Dacron. In animals with a broad thorax it was possible to mobilize the blood vessels sufficiently to make an end-to-end cavocaval anastomosis. Anesthesia was induced by giving 6 ml of a 2.5% thiamylal solution i.v. Pentrane, O_2, and N_2O anesthesia was used with endotracheal intubation and artificial respiration. Administration of 25 mg/kg of oxytetracycline i.v. during surgery reduced the number of positive blood cultures. After surgery, animals received repeated infusions of glucose, transfusions, and bicarbonate or trometamol in an attempt to correct acidosis. Animals finally went into comas with acidotic respiration and, occasionally, with convulsions followed by death. Three of 22 dogs died during surgery due to an overdose of barbiturates, an air embolism secondary to a lesion in the subphrenic veins, and a lesion of the portal vein which made it impossible to establish a portacaval anastomosis. The survival time after surgery varied from 4-31 hr (average 10.5 hr). Many animals developed changes in blood-clotting factors including a rapid decrease in blood fibrinogen levels. In all cases, autopsy findings included the presence of unclotted blood in the peritoneum and, in some cases, diffuse petechial hemorrhages.

1547 **STUDY OF 72 HEPATIC COMAS: COMPARISON OF CLINICAL, BIOLOGICAL, AND ANATOMICAL FINDINGS IN 105 CASES.** *(Fr.)* Dubrisay, J. (Beaujon Hosp., Clichy, France), J. F. Foncin, P. Pouillart and D. Mahoudeau. *Arch Franc Mal Appar Dig* 57(11):869-892, 1968.

A comparison was made of the clinical symptoms; EEG tracings; blood ammonia, urea, and electrolyte levels; and histological changes in the livers and brains of 72 patients who died in hepatic coma and 33 patients with liver disease who died of other causes. The most common symptoms among patients in hepatic coma were jaundice (56 cases), edema and ascites (53 cases), and gastrointestinal bleeding (28 cases). Neurological examinations of 64 of these patients showed that 34 had disturbances in tonus, 30 had pyramidal signs, 23 had asterixus, and 3 had generalized convulsions. Except for the coma, no objective neurological symptoms were present in 12 cases. Comas developed more than 4 days before death in about 2/3 of these patients. Of the 51 comatose patients on whom EEG tracings were made, 38 had changes specific for hepatic encephalopathy and 13 had nonspecific changes; only nonspecific changes were found in the 12 controls examined. Venous ammonia levels were very high in 47 of 64 patients with hepatic coma, but in only 2 of 10 controls. However, ammonia levels were normal in 8 comatose patients and slightly elevated in 9. There were no apparent correlations between ammonia levels and clinical symptoms, EEG findings, or neurological signs. The results of urea determinations made 2 days before death were normal in 15 of 50 cases and were elevated in 35. Plasma electrolytes determined at the same time on 54 patients showed that the electrolyte balance was normal in 20 cases. Low Na levels were found most frequently followed by high K levels. Low K levels were always associated with low Na levels. True renal insufficiency was present in 15 of 42 patients. Some of these patients had not received diuretics and did not have edema or ascites.

1548 **HEREDITARY RECURRENT INTRAHEPATIC CHOLESTASIS FROM BIRTH.** *(E.)* Aagenaes, O. (State Hosp., Oslo, Norway), C. B. van der Hagen and S. Refsum. *Arch Dis Child* 43(232):646-657, 1968.

A comprehensive study of 16 patients (5 males and 11 females) with neonatal cholestasis born during a 33-yr period in a small district in Southwest Norway revealed that all belonged to 7 sibships in the same 13-generation family; at least one parent of each sibship (and both in 3 cases) was descended from one 16th century Norwegian couple, and 6 of the 7 parental pairs were consanguineous. Among the 28 children of the 6 sets of normal parents (there was one affected mother-daughter pair), 15 were affected. Of 5 patients born before 1939, when vitamin K was introduced, 4 died of hemorrhage in the first weeks of life; of 4 receiving at least 1 dose of vitamin K after birth, 3 died between 5 and 9 months of age, 2 possibly of hemorrhage. Consistent vitamin K therapy has been administered to the remaining 7 patients. Diagnosis in the 7 dead infants was based on a history of jaundice, dark urine, and pale stools in the early days of life. All children except 1 were born after uncomplicated pregnancies; 1 patient was born to an affected mother who experienced a cholestatic episode during pregnancy. All patients had jaundice at birth or before 1 week of age; the stools were pale and the urine dark, but the children were otherwise in good condition. Cholestasis persisted in varying degrees for 1-6 yr. Laboratory analyses revealed hyperbilirubinemia (conjugated bilirubin), increased transaminases and alkaline phosphatases, hyperlipemia, slightly decreased serum albumin, elevated α_2-globulins and elevated serum copper; there was also biochemical and X-ray evidence of rickets. Other complications included malabsorption, growth retardation, increased fecal fat, tooth enamel defects with discoloration, and symptomless neuropathy with decreased nerve conduction velocity; children regained normal stature after the end of the cholestatic period. Prepubertal subjects experienced leg edema in both cholestatic and noncholestatic periods; the causes were unknown. All adult patients experienced 1-5 cholestatic episodes after childhood, provoked by surgery and pregnancy. Histological studies showed giant-cell transformation of the liver with intracytoplasmic pigment retention in infants and intracanalicular cholestasis with only a few multinucleated or giant cells in adults. All but one of the parents of the 7 sibships were normal except for an elevated serum bilirubin, which could be due to heterozygosity. It is suggested that this inborn metabolic error be named "hereditary recurrent intrahepatic cholestasis from birth".

1549 **LIVER TRANSPLANTATION: PHYSIOPATHOLOGICAL STUDY OF THE AHEPATIC PHASE.** *(It.)* Arullani, A. (2nd Surg. Clin., U. Rome, Italy), A. Gargiulo, B. Baroni, G. Sanpietro, C. Casciani and R. Cortesini. *Policlinico [Chir]* 75(6):319-331, 1968.

After a preliminary study of the effect of blood vessel ligation on the pH and blood pressure, a technique was developed for transplanting the liver in dogs. A side-to-side mesenterocaval shunt was made in 5 dogs under general anesthesia and artificial respiration. The liver was then isolated and removed after an external bypass anstomosis had been established between the femoral and jugular veins with a prosthesis. During surgery the animals received only 3 mg/kg heparin and slow infusions of saline. After clamping of the vena cava and portal vein, a sudden decrease occurred in the arterial pressure which then returned rapidly to normal values but decreased again to undesirably low levels after 30-40 min. At about this time tachycardi was observed, probably because of hypotension. Pressure in th vena cava and portal vein were directly and reciprocally related and depended upon the permeability of the portacaval shunt and the effectiveness of the external bypass. Mechanical hype ventilation was used to compensate for the marked acidosis which developed in all cases. Blood sugar levels decreased below 0.35 mg% 20-30 min after removal of the liver. After 1 h the hematocrit was 50% of its initial value. SGOT and SGPT activities showed no consistent behavior. No appreciable chang occurred in blood amylase or serum Na and K levels. Studies in nonheparinized dogs showed severe disorders in blood coagu lation. The clotting time was lengthened indefinitely, probabl due to low blood levels of prothrombin and fibrinogen, low platelet counts, and spontaneous lysis of the clot. Hemorrhages only appeared after 90-120 min.

1550 **QUANTITATIVE DETERMINATION OF BLOO AMMONIA IN THE HEPATIC DYSFUNCTION CAUSED BY DISEASES OF THE LIVER AND BILIARY TRACT.** *(Jap.)* Futawatari, H. (Shibushi Natl. Sanatorium, Kagoshima, Japan). *Iryo* 22(11):1308-1314, 1968.

Blood ammonia levels were measured in 54 patients with hepatic dysfunction caused by liver and biliary tract diseases, and compared to the results of liver function tests, serum enzyme determinations, and subjective and objective clinical evaluations. It was noted that when the blood ammonia decreased the clinical picture improved; on the other hand, the blood ammonia always increased gradually when there was no clinical improvement. This experiment shows that the blood ammonia level can be utilized as an index of hepatic function in liver and biliary tract diseases.

1551 **THE HISTOGENESIS AND CLINICAL SIGNIFICANCE OF ACIDOPHILIC BODIES IN VARIOUS LIVER DISEASES.** *(E.)* Cavalli, G. (Inst. Clin. Gen. Med., U. Bologna, Italy), F. B. Bianchi and A. M. Casali. *Digestion* 1(6):353-369, 1968.

In order to determine the etiology, fate and clinical significan of acidophilic bodies in liver disease, 420 liver biopsies were examined with the following distribution: 50 cases of acute hepatitis, 105 cases of chronic hepatitis, 94 cases of cirrhosis, 12 primary hepatic neoplasms and 159 miscellaneous cases in which the liver was only secondarily involved in the disease. The acidophilic bodies, although not specific, had a maximum incidence (about 50%) in acute hepatitis and their presence su ported other morphological criteria in the diagnosis. In chron hepatitis and cirrhosis the incidence of these bodies was only about 10% and their presence could not be related to a histor of acute hepatitis. Acidophilic bodies were found in only 5 of the 159 miscellaneous cases. Acidophilic degeneration is concluded to be a specific and complex regressive phenomeno which terminates in the death and phagocytosis of the liver cell. The cell manifests general signs of impairment characterized by cytoplasmic vacuoles and fatty infiltration, followe by a rearrangement of the subcellular organelles. The hyaloplasm frequently shows uneven electron density, while the nucleus has a grossly irregular appearance and its membrane is interrupted in many points. After progressive fragmentatio of these cells, the process terminates with their phagocytosis by the histiocytes.

1552 IMMUNOLOGICAL PROCESSES IN LIVER DISEASES WITH SPECIAL CONSIDERATION OF LE- AND PSEUDO-LE-PHENOMENA. *(Ger.)* Keitel, W. (Med. Acad., Magdeburg, Germany) and U. J. Jürgensen. *Z Ges Inn Med* 22(21):669-673, 1968.

The latex test for lupus erythematosus (LE) cells was run on 60 patients with viral hepatitis and 31 with chronic hepatitis and/or cirrhosis. No LE cells were found in patients with viral hepatitis, but 12 had pseudo-LE cells. These 12 patients tended to have higher transaminase and serum iron levels than the remaining 48, but the differences were not statistically significant. Of the cirrhotic patients, 2 had LE cells and 5 had pseudo-LE cells. The 2 patients with LE cells were women with a history of rheumatic disease, jaundice, signs of severe parenchymal damage, elevated erythrocyte sedimentation rates and high γ-globulin levels. Clinical findings were about the same in patients with chronic liver disease and pseudo-LE cells and those with negative tests for LE cells.

1553 FAMILIAL CHOLESTATIC JAUNDICE IN CHILDREN: STUDY OF EIGHT CASES IN THREE SIBSHIPS. *(Fr.)* Alagille, D. (Parrot Hosp., Bicêtre, France), J. Borde, E. Habib, Z. Joannides, N. Thomassin and L. Kremp. *Rev Int Hepat* 18(6):701-783, 1968.

Case reports are presented for 8 children (5 males and 3 females) in 3 families who had jaundice at birth or developed it shortly thereafter. All of these children had high blood lipid and cholesterol levels, and the older children had pruritus and bone changes. No other family members had a history of jaundice, and none of the parents were blood relatives. In the 1st family all 4 boys were affected and 3 died at 70 days, 3 months, and 22 months, resp. The mother had had severe vomiting during her 2nd pregnancy, pyelonephritis during the 3rd, and metrorrhagia during the 4th. The father died of chronic kidney disease. Two of their children had atresia of the intrahepatic biliary tract, 1 had atresia of the extrahepatic biliary tract, and 1 had hepatitis. The sole survivor, who had complete atresia of the interlobular bile ducts and a normal parenchyma, improved clinically after a cholecystojejunal anastomosis was made. Lipid retention also improved after surgery. The mother of the 2nd family had 2 abortions and 4 living children (3 boys and 1 girl). Two of the boys were jaundiced for about 12 days after birth but developed normally. The 3rd boy, who was born in the 8th month of pregnancy, had atresia of the intrahepatic bile ducts. Other anomalies included craniofacial dysmorphism, hypertelorism, and low-set ears. At surgery the common bile duct proved to be too narrow to make a biliodigestive anastomosis. The sister of this patient died at 1 yr 3 months with biliary cirrhosis and atresia of the extrahepatic biliary tract. The 2 girls in the 3rd family had atresia of the intra- and extrahepatic biliary tract and giant-cell hepatitis. One died at 5 yr of decompensated biliary cirrhosis. These observations are compared to 98 similar cases in 40 different families reported in the literature.

1554 AMEBIC ABSCESS OF THE LIVER: EXPERIENCE WITH 15 CASES IN 3½ YEARS IN CALIFORNIA. *(E.)* Knauer, C. M. (Santa Clara Valley Med. Ctr., San Jose, Calif.). *Amer J Dig Dis* 14(4):253-261, 1969.

In 15 patients with amebic liver abscess seen at 2 California county hospitals over a 3.5-yr period, 9 diagnoses were proven (*Entamoeba histolytica* was demonstrated in 7, while 2 had positive indirect hemagglutination tests with very high titers) and 6 diagnoses were presumptive (no organism was detected, but they had clinical courses and abscess material characteristic of the disease). Fourteen of the patients had made a recent trip or had ready access to Mexico. The clinical finding of particular note was the high incidence of right lower lung field abnormalities (8 of 12 chest X-rays were abnormal). Useful laboratory findings included the combination of an elevated BSP, alkaline phosphatase and direct bilirubin. Liver scanning was consistently helpful in confirming the presence of a suspected abscess, determining its localization and evaluating the results of therapy. Secondary infection of the abscesses occurred in 8 of 10 patients. All patients received drug therapy (tetracycline, chloroquine and usually emetine) and in addition 8 patients had surgical drainage, 3 received needle aspiration and 1 patient received a combination of surgical drainage and needle aspiration. The uncomplicated postoperative courses of these patients is of particular importance since this approach has been considered in the past to be most hazardous.

1555 CHANGES IN THE NUCLEIC ACID CONTENT AND OXYGEN CONSUMPTION OF THE LIVER IN ACUTE EXPERIMENTAL PERITONITIS. *(Rus.)* Neiko, Ie. M. (Ivano-Frankovsk Med. Inst., USSR). *Pat Fiziol Eksp Ter* 12(6):64-65, 1968.

1556 THE BACTERIOLOGICAL EXAMINATION OF LIVER BIOPSY SPECIMENS. *(Ger.)* Platzer, S. (Med. Clin., U. Innsbruck, Austria), E. Semenitz and H. J. Födisch. *Z Gastroent* 6(5):352-355, 1968.

1557 PATHOLOGICAL RUPTURE OF THE LIVER WITH INTRAABDOMINAL HEMORRHAGE IN A PATIENT WITH HEPATIC CARCINOMA. *(Ger.)* Hodel, C. (Inst. Path. Anat., U. Basel, Switzerland). *Acta Hepatosplen* 15(4):252-256, 1968.

1558 LIVER FUNCTION TESTS IN LEPROSY. *(E.)* Dhople, A. M. (Indian Counc. Med. Res., New Delhi) and S. Balakrishnan. *Indian J Med Res* 56(10):1552-1558, 1968.

1559 STUDY OF CHANGES IN THE METABOLISM OF GLUCOCORTICOID HORMONES IN SOME LIVER DISEASES. *(Rum.)* Bușilă, V. T. (Med. Inst., Timisoara, Romania), M. Dragomirescu, V. Marțincu, L. Dragomirescu and A. Plăcintă. *Med Intern (Bucur)* 20(9):1099-1105, 1968.

1560 DISEASES OF THE INTRAHEPATIC BILE DUCTS. *(Fr.)* Caroli, J. (St. Antoine Hosp., Paris, France). *Rev Medicochir Mal Foie* 43(6):211-230, 1968.

1561 SOME CLINICAL ASPECTS OF INTRAHEPATIC LITHIASIS. *(Fr.)* Mansouri, H. (Surg. Svc., Mustapha Hosp., Algiers, Algeria), A. S. Bendali, G. Illoul, M. Seddik, A. Allouache and V. Mirzezcu. *Rev Medicochir Mal Foie* 43(6):189-210, 1968.

1562 **CHRONIC CIRRHOTOGENIC HEPATITIS WITH ANTINUCLEAR ANTIBODIES.** *(Fr.)* Vachon, A. (Hotel Dieu, Lyon, France).and R. Tête. *Acta Gastroent Belg* 31(11):758-763, 1968.

1563 **ACTIVE CHRONIC HEPATITIS WITH SYSTEMIC MANIFESTATIONS AND AUTOIMMUNE SERUM REACTIONS.** *(Fr.)* Pirotte, J. (Inst. Med., U. Liege, Belgium), L. Ruyters, J. Salmon and J. Gach. *Acta Gastroent Belg* 31(11):764-779, 1968.

1564 **CLINICAL, PSYCHOLOGICAL AND ELECTROENCEPHALOGRAPHIC STUDY OF A GROUP OF CHILDREN WHO HAD NEONATAL JAUNDICE.** *(Fr.)* Masson, A. (Hosp. Ctr., U. Strasbourg, France), C. Isch, M. Papachristou, P. Yannoulatos, L. Tordo and E. Schneegans. *Ann Pediat (Paris)* 44(54):2416-2424, 1968.

1565 **ORTHOTOPIC HOMOTRANSPLANTATION OF THE LIVER WITHOUT INTERRUPTION OF THE HEPATIC CIRCULATION (PROPOSAL FOR A NEW TECHNIQUE).** *(It.)* Mazzoni, G. (Victor Emanuele III Munic. Hosp., Valmontone, Rome, Italy). *Chir Gastroent* 2(4): 492-497, 1968.

1566 **THE TREATMENT OF LIVER METASTASES WITH INTRA-ARTERIAL CHEMOTHERAPY.** *(Fr.)* Mattheiem, W. and Y. Kenis. *Bull Cancer* 55(2):261-268, 1968.

1567 **PATHOGENETIC RELATIONS BETWEEN THE JAUNDICE SYNDROME AND SERUM TRANSAMINASE.** *(Rum.)* Buşilă, V. T. (Med. Inst., Timisoara, Romania) and M. Dragomirescu. *Rev Medicochir Iasi* 72(3): 587-593, 1968.

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1570 **COMMON BILE DUCT OBSTRUCTION BY ASCARIS WITH HEPATIC ABSCESS. [CASE REPORT]** *(E.)* Park, C. H. (DePaul Hosp., Norfolk, Va.), R. J. Nold, H. W. Kuehn and J. Foster. *Virginia Med Monthly* 95(12):725-728, 1968.

1571 **INCIDENCE OF IDIOPATHIC JAUNDICE AND PRURITUS OF PREGNANCY IN CHILEAN WOMEN.** *(Sp.)* Reyes, H. (Salvador Hosp., Santiago, Chile), M. E. Radrigan, G. Schramm and R. Katz. *Rev Med Chile* 96(6):409-414, 1968.

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1575 **EXPERIMENTAL TECHNIQUE FOR EXTRACORPOREAL PERFUSION OF A PIG LIVER.** *(Ger.)* Häring, R. (Surg. Clin., Free U. Berlin, Germany), H. Brehme, S. Dressler, H. Kindler, H. Kotlorz, H. G. Kühn, H. J. Linkenbach, R. de Peña Perez, L. C. Tung, J. Waldschmitt and D. Xanthakos. *Med Welt* 20(2):82-85, 1969.

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1581 **ACTIVITY OF THE PANCREATIC ENZYMES IN CHRONIC HEPATITIS AND CIRRHOSIS AND THEIR CLINICAL SIGNIFICANCE.** *(Rus.)* Valenkevich, L. N. (Leningrad Inst. Sanit. Hyg. Med., USSR). *Ter Arkh* 40(10): 77-79, 1968.

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1588 **EFFECTS OF PORTACAVAL SHUNTS AND EXPERIMENTAL LIVER DISEASE ON INTESTINAL ABSORPTION OF AMMONIA.** *(E.)* Windsor, C. W. O. (U. California Sch. Med., San Diego), B. Goodhead and M. J. Orloff. *Surg Forum* 19:333-335, 1968.

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1594 **EFFECT OF HYPERBARIC OXYGENATION ON WEIGHT GAIN OF THE LIVER DURING PERFUSION PRESERVATION.** *(E.)* Huntley, R. (U. Colorado Sch. Med., Denver), B. A. Bartholomew, E. Bielanski, J. Homatas and B. Eiseman. *Surg Forum* 19:352-354, 1968.

1595 **LIVER SCANS AFTER ORTHOTOPIC HEPATIC HOMOTRANSPLANTATION, BILIARY OBSTRUCTION, AND DEVASCULARIZATION PROCEDURES.** *(E.)* Groth, C. G. (U. Colorado Sch. Med., Denver), D. W. Brown, J. D. Cleaveland, D. J. Cordes, L. Brettschneider and T. E. Starzl. *Surg Forum* 19:350-351, 1968.

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1597 **THE PATHOPHYSIOLOGY AND TREATMENT OF NEONATAL JAUNDICE.** *(Kor.)* Moon, Y. E. (Cheil Hosp., Seoul, Korea). *J Kor Med Ass* 11(9):722-725, 1968.

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1600 **EFFECT OF NONCOMPLICATED DISEASES OF THE BILIARY TRACT ON LIVER FUNCTION.** *(Cz.)* Chlumsky, J. (Fac. Med. Hyg., Charles U., Prague, Czechoslovakia) and A. Chlumska. *Cas Lek Cesk* 107(49):1483-1488, 1968.

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1605 **EXTENSIVE INTRAVASCULAR SPREAD OF MALIGNANT HEPATOMA. [CASE REPORT]**
(E.) Dean, A. C. B. (Dept. Surg. Sci., U. Edinburgh, Scotland) and M. D. Middleton. *J Roy Coll Surg Edinb* 14(2):117-120, 1969.

See also: 1195,1200,1203,1205,1206,1208,1209,1213,1217,1218,1224,1226,
1227,1230,1231,1235,1242,1244,1247,1248,1253,1297,1768

1606 **HEPATIC VEINS OF MONKEYS WITH VENO-OCCLUSIVE DISEASE: SEQUENTIAL ULTRASTRUCTURAL CHANGES.** *(E.)* Allen, J. R. (Dept. Path., U. Wisconsin, Madison), L. A. Carstens and G. J. Katagiri. *Arch Path* 87(3):279-289, 1969.

Ultrastructural changes occurring in the hepatic vessels of adult female *Macaca speciosa* monkeys poisoned with monocrotaline were followed at various intervals up to 32 days after i.p. administration of 0.125 g/kg body weight of the hepatotoxin. Only 8 of 18 treated animals survived more than 32 days. The serum total protein declined within one week after administration of the toxin, reaching 4.8 g% by the 32nd day (normal level 7.2 g%). The albumin/globulin ratio and the distribution of various globulin fractions also shifted during this period, and the plasma prothrombin time increased. Serum bilirubin averaged 2.8 mg% on the 14th day of the experiment, but was less than 1.0 mg% in all monkeys which survived at least 28 days. SGOT activity increased within 24 hr following the administration of monocrotaline and remained elevated through the observation period. Light and electron microscopy revealed that the toxic effects of monocrotaline on the hepatic vessels initially involved the endothelial cells of small- and medium-sized vessels. Within 24 hr, separation of the binding sites of contiguous endothelial cells and shrinkage or swelling of endothelial cells with subsequent rupture were observed. There was progressive loss of the endothelial lining during the next 2 weeks until only isolated endothelial cells were detectable; in areas of complete denudation of the endothelium and basal lamina, the smooth muscle cells were indirect contact with the circulating blood. Fluid and blood constituents adhered to the denuded surfaces and penetrated the vessel wall, causing wide separation of the collagen fibers and fibroblasts. By the end of the 2nd week, the edematous vessel wall caused distortion or obliteration of the vascular lumen. During the 3rd and 4th weeks there was a decrease in the fluid content of the vessels and proliferation of fibrous connective tissue; many lumens were filled with collagen fibers. Necrotic cells, free cytoplasmic organelles, large membrane-bound cytosegresomes and electron-dense cellular fragments were scattered throughout the vessel wall. Many vessels were recanalized by capillaries enclosed by a single layer of continuous endothelium; the only remnants of the original vessel wall were a few randomly located smooth muscle cells.

1607 **BACTERIAL ABSCESSES OF THE LIVER: 16 RECENT CASES.** *(Fr.)* Dandurand, B. (Hotel Dieu, Montreal, Quebec, Canada), M. Saint-Martin and L. Beaudoin. *Un Med Canada* 98(1):55-62, 1969.

Non-parasitic abscesses of the liver were found in 16 patients (8 men and 8 women, aged 37-76 yr) out of 35,200 (0.04%). *Escherichia coli* was isolated in 6 cases, *Streptococcus fecalis* in 2, *Proteus mirabilis* in 2, *Staphylococcus aureus* in 1, *Klebsiella pneumoniae* in 1, and *Fusobacterium* in 1. Cultures were negative in 5 cases. Abscesses reached the liver via the portal vein in 5 cases, the biliary tract in 8, and spread from adjacent organs in 3. Single abscesses were present in 3 cases and miltiple abscesses in 12 (unspecified in 1 case). In 3 cases the abscess was produced by advanced peritonitis, in 2 by localized intraabdominal infections, in 6 by angiocholitis, and in 3 by infections in adjacent organs. Hydatid cysts of the liver were present in 3 of these 16 patients. Despite antibiotic therapy, 12 of these patients died.

1608 **LIVER LESIONS IN SATURNISM (HISTOLOGICAL, HISTOCHEMICAL AND ELECTRON MICROSCOPIC STUDY).** *(Rum.)* Banciu, T., (Inst. Med., Timisoara, Romania), L. Georgescu, A. Petrovici and C. Ungureanu. *Med Intern (Bucur)* 20(9):1139-1146, 1968.

1609 **THE EFFECT OF N'-NITRO-N-NITROSO-METHYLGUANIDINE ON THE LIVER AFTER ADMINISTRATION TO THE RAT.** *(E.)* Craddock, V. M. (Med. Res. Counc. Labs., Carshalton, England). *Experientia* 24(11):1148-1149, 1968.

1610 **THE USE OF PROGESTOGENS IN WOMEN WITH A PREVIOUS HISTORY OF INTRAHEPATIC CHOLESTASIS CAUSED BY GESTAGENS AND/OR PREGNANCY (PRELIMINARY COMMUNICATIONS).** *(Sp.)* Dominguez L., J. P., (J. J. Aguirre Hosp., Santiago, Chile), J. M. Orellana A., J. Zañartu and E. Maldonado. *Rev Med Chile* 96(6):407-409, 1968.

1611 **STUDIES ON IMMUNOLOGICAL DAMAGE TO THE LIVER CELL. I. FIXATION OF ANTI-LIVER ANTIBODIES ON THE RAT LIVER CELL MEMBRANE.** *(Jap.)* Miyazaki, T. (Okayama U. Sch. Med., Japan). *Allergy (Japan)* 17(12):958-963, 1968.

1612 **STUDIES ON IMMUNOLOGICAL DAMAGE TO THE LIVER CELL. II. CYTOTOXIC EFFECTS OF ANTI-LIVER ANTIBODIES ON LIVER CELLS.** *(Jap.)* Miyazaki, T. (Okayama U. Sch. Med., Japan). *Allergy (Japan)* 17(12):964-972, 1968.

1613 **CARBON TETRACHLORIDE INTOXICATION WITH HEPATIC NECROSIS AND ACUTE TUBULAR RENAL INSUFFICIENCY.** *(Ger.)* Asshauer, E. (Bernhard Nocht Inst. Marine Trop. Dis., Hamburg, Germany) and H. Goethe. *Med Welt* 20(2):102-104, 1969.

1614 **HEPATIC TOLERANCE FOR A MODERN ESTROGEN PREPARATION.** *(Ger.)* Seifert, E. (Hanusch Hosp., Vienna, Austria). *Med Welt* 20(8):427-430, 1969.

1615 **CHANGES IN THE RESULTS OF SOME LIVER FUNCTION TESTS IN WORKERS IN THE SYNTHETIC RUBBER INDUSTRY.** *(Rus.)* Bashirov, A. A. (M. M. Efendi-Zade Azerbaijan Sci. Res. Inst. Labor Hyg., USSR). *Ter Arkh* 40(10):79-81, 1968.

1616 **TOXIC LIVER DAMAGE DUE TO ETHIONAMIDE.** *(E.)* Kuntz, E. (Med. Clin., Justus-Liebig U., Giessen, Germany), J. Lier and W. Pfingst. *German Med Monthly* 13(12):599-602, 1968.

1617 **INTRAHEPATIC AIR - A SIGN OF TRAUMA.** *(E.)* Wolfel, D. A. (U. New Mexico Sch. Med., Albuquerque) and B. G. Brogdon. *Radiology* 91(5):952-953, 1968.

1618 **FATTY LIVER, HYPERLIPEMIA, AND ERYTHROCYTE ALTERATIONS PRODUCED BY ETHANOL FEEDING IN THE RAT.** *(E.)* Baraona, E. (Bronx Veterans Hosp., N. Y.) and C. S. Lieber. *Amer J Clin Nutr* 22(3):356-357, 1969.

1619 **CHANGES IN THE PROTEIN COMPOSITION AND TRANSAMINASE ACTIVITY OF THE BLOOD SERUM AND LIVER OF RATS UNDER THE INFLUENCE OF LARGE DOSES OF ANTIHEPATOCYTOTOXIC SERUM AND ANTIRETICULAR CYTOTOXIC SERUM (BOGOMOLETS SERUM).** *(Uk.)* Alekseieva, I. N. (A. A. Bogomolets Inst. Physiol., Acad. Sci. Ukr. SSR., Kiev, USSR). *Fiziol Zh (Kiev)* 780-789, 1968.

1620 **RIGHT LOBECTOMY FOR LIVER TRAUMA.** *(Fr.)* Sirot, L. and J. Miguet. *Mem Acad Chir (Paris)* 94(25/26):701-703, 1968.

1621 **MAJOR HEPATECTOMIES FOR LIVER TRAUMA: THEIR BIOLOGICAL CONSEQUENCES.** *(Fr.)* Delavierre, P. (de Vaugirard Hosp., Paris, France), R. Rettori, P. Morpin-Alleron, P. Vayre and J. C. Levasseur. *Sem Hop Paris* 45(3):191-198, 1969.

1622 **TREATMENT OF PARASITIC DISEASES OF THE LIVER.** *(E.)* Spingarn, C. L. (Mount Sinai Sch. Med., City U. New York, N. Y.). *Mod Treatm* 6(1):153-164, 1969.

1623 **RECOGNITION, PREVENTION, AND TREATMENT OF DRUG-INDUCED HEPATITIS.** *(E.)* Popper, H. (Mount Sinai Sch. Med., City U. New York, N. Y.). *Mod Treatm* 6(1):142-152, 1969.

1624 **ACUTE AND CHRONIC EFFECTS OF AFLATOXIN ON THE LIVER OF DOMESTIC AND LABORATORY ANIMALS: A REVIEW.** *(E.)* Newberne, P. M. (Dept. Nutr. Food Sci., Massachusetts Inst. Technol., Cambridge). *Cancer Res* 29(1):236-250, 1969.

See also: 1121,1173,1266

1625 **CHEMOTHERAPEUTIC STUDIES ON MOUSE HEPATITIS VIRUS: I. EFFECT OF ANTIVIRAL AGENTS ON THE SWELLING OF MOUSE LIVER MITOCHONDRIA *IN VITRO*. II. EFFECT OF METHANOL ON MOUSE HEPATITIS VIRUS *IN VITRO*. III. ANTIVIRAL EFFECT OF SOME PHARMACODYNAMIC DRUGS.** *(E.)* Kanoh, S. (Natl. Inst. Hyg. Sci., Osaka, Japan). *Chemotherapy* 16(6):783-791, 1968.

When mitochondria were prepared from the livers of normal and infected mice (EHF-120 strain of mouse hepatitis virus [MHV] i.p.) according to the method of Hogeboom, mitochondria from infected mice did not show swelling *in vitro*. Xenaldial (1.2×10^{-3} to 1.2×10^{-5} M) and Benadryl (1.1×10^{-4} to 1.1×10^{-5} M) did not prevent swelling of mitochondria prepared from normal mouse liver when added to the mitochondrial suspension *in vitro*, even though these agents are effective against viral hepatitis. Studies on the effect of methanol revealed that incubation of infected mouse liver homogenates with up to 30% methanol for 3 hr at OC did not completely inactivate MHV, although inactivation was complete at 40%. Fractionation studies revealed that virus activity was concentrated mainly in the cytoplasmic supernatant. Addition of methanol (30-40%) reduced the nonprotein nitrogen content of the supernatant, but there was no increase in the specific viral activity so that purification of MHV remains a problem. When the antiviral effects of Xenaldial, Benadryl, p-carboxy-N-methylacetyl-nicotinic acid, and Formycin on MHV were compared *in vitro* and *in vivo*, Xen Xenaldial showed a potent antiviral effect *in vitro*, but no therapeutic effect *in vivo*. Benadryl, p-carboxy-N-methylacetyl-nicotinic acid, and Formycin showed a slight therapeutic effect *in vivo*.

1626 **FURTHER EXPERIMENTS WITH ALCOHOL-TREATED HEPATITOGENIC SERUM.** *(E.)* Csapó, J. (Laszlo Cent. Hosp. Infect. Dis., Budapest, Hungary), J. Budai, G. Nyerges, P. Richter and I. Tóth. *Acta Paediat Acad Sci Hung* 9(3/4):213-217, 1968.

Serum pools obtained from children with infectious hepatitis were subjected to a form of alcohol treatment that had been shown to preserve some of the hepatitis viral activity in adult serum pools, in order to determine whether any part of the virus present in children's sera would resist such a procedure; subsequently, alcohol-treated serum was administered by the oral route to children to test whether illness would follow the administration of such a slightly hepatitogenic preparation. No children receiving i.m. injections of either 0.01 g serum protein treated with 40% alcohol for 14 days at -5C or 0.03-0.04 g lyophilized serum protein treated with 40% alcohol for 12 days developed hepatitis. Two of 15 children inoculated with 0.04 g serum protein treated for 70 hr with 21% alcohol developed mild hepatitis on the 82nd and 83rd day, resp. An oral dose of 0.1 g of the lyophilized powder treated with 21% alcohol for 70 hr (proven to contain virus) was given to 24 children; none of the children became ill and no signs suggestive of hepatic injury could be detected for up to 100 days. Five to 13 months after oral vaccination, the children were challenged with 0.04 g serum protein i.m., prepared by the method used for the oral vaccine. As controls, 24 other children were also challenged. No signs of hepatitis could be detected in either group, suggesting that the serum had become noninfective during the 18-month interval.

1627 **GLUCOCORTICOID THERAPY IN ACUTE VIRAL HEPATITIS AND ITS SEQUELAE.** *(Ger.)* Kommerell, B. (Med. Clin., U. Heidelberg, Germany) and G. Schettler. *Munchen Med Wschr* 111(4):180-185, 1969.

The results of liver function tests were compared in 251 patients treated with glucocorticoids and 166 untreated controls. Treated patients included 147 with acute viral hepatitis who received total doses of 50-2500 mg of prednisone or prednisolone over a period of 5-110 days; 52 with chronic hepatitis who received up to 4000 mg of steroids over a period of up to 170 days; and 52 with posthepatitic cirrhosis who received up to 2300 mg prednisone over a period of 5-90 days. Patients selected for steroid therapy generally had more severe forms of liver disease than the controls. No differences were seen in the time required for serum bilirubin levels, transaminase, alkaline phosphatase, and protein fractions to return to normal in treated and untreated patients with acute viral hepatitis. Similar results were obtained for patients with chronic hepatitis and posthepatitic cirrhosis. Steroid therapy did not appear to prevent acute hepatitis from becoming chronic. Complications of steroid therapy included steroid diabetes in 3% of these patients and reactivation of tuberculosis in 1 case. Bleeding peptic ulcers developed in 4 of the steroid-treated patients and in 3 of the controls. None of these patients had a history of peptic ulcers.

1628 **MOTOL VIRUS AND ANTIBODIES IN THE SERUM DURING AND AFTER INFECTIOUS HEPATITIS.** *(Cz.)* Koza, J. (Inst. Epidem. Microbiol., Prague, Czechoslovakia), J. Rampas and K. Žáček. *Cesk Epidem* 17(6):347-352, 1968.

Serological and immunological studies on 268 serum samples obtained at various stages of infectious hepatitis or during the convalescent period (up to 12 months after discharge) failed to reveal any neutralizing or hemagglutinin-inhibiting antibodies to either the cytopathogenic or the hemagglutinating antigens of the Motol virus family (strains Bilina, Strelna, Brezanky, Dubi, Kostany, Duchcov, Osek, Liptice, Hrob, Vernerice, Kolin and Teplice). Blood samples were taken from children (4-14 yr old) with viral hepatitis and from control children (1-6 yr old) with no history of hepatitis. Neutralization titers (50%) of 1:2-1:64 were obtained with various strains of Motol virus in both patients (from before hospitalization to 4 months thereafter) and controls; sera from both groups of children also showed hemagglutinin titers of from 1:4 to 1:1024. There was no correlation between the presence of Motol virus antibodies and a history of viral hepatitis.

1629 **EPIDEMIOLOGICAL CONSIDERATIONS ON HEPATITIS OF OCCUPATIONAL ORIGIN AND ITS PREVENTION.** *(Ger.)* Weiss, G. (Prov. Inst. Occup. Med., Berlin, Germany) and M. Münzer. *Zbl Arbeitsmed* 18(12):361-366, 1968.

In order to derive some information about the relative incidence and possible prevention of infectious hepatitis among medical personnel, questionnaires were sent to 334 patients who developed viral hepatitis of occupational origin between 1950 and 1965 in

Berlin. The 216 who replied included 44 physicians, 93 nurses, 32 laboratory workers or medical technicans, and 24 kindergarten teachers; 11 of these had had a previous attack of infectious hepatitis (not job-related) and 39 (including the 32 laboratory workers) reported no actual contact with hepatitis patients. The 44 physicians included 27 internists and 7 surgeons, yielding an estimated risk of infection of 9.7% and 3.25%, resp. for the 2 groups. The 92 nurses included 50 from internal medical wards, 15 from pediatric wards and 10 from surgical wards, yielding an estimated risk of 2.1%, 2.1% and 1.5%, resp. The time lost from work as a result of hepatitis varied from 17 days to 5.5 yr, and 189 of the 216 patients had to be hospitalized (26 more than once). Furthermore, 35 of the 216 patients changed occupations as a result of the experience. Considering that the risk of infectious hepatitis is about 4 times as high among hospital personnel as among the general population, γ-globulin prophylaxis is strongly recommended for exposed medical personnel. Such prophylaxis was only given to 9 of the 216 cases, and in 6 of these only after the appearance of symptoms.

1630 **INFLUENCE OF PREDNISONE ON THE COURSE OF EPIDEMIC HEPATITIS.** *(E.)* Duliček, K. (Dept Infect. Dis., Charles U., Hradec Kralove, Czechoslovakia). *Sborn Ved Prac Lek Fak Karlov Univ* 11(3):371-385, 1968.

A double-blind study of the effect of prednisone on the course of epidemic hepatitis was performed in 50 patients with either a serum bilirubin above 10 mg% (44 patients) or a value of not less than 5 mg% for at least 3 weeks (6 patients). Half of each group (10 men and 15 women; average 41.7 yr old) received 5-mg tablets of placebo beginning an average of 16.5 days after disease onset; the other half (11 men and 14 women; average 44.6 yr old) received 5-mg tablets of prednisone beginning an average of 13.6 days after disease onset. Dosage was 0.43 mg/kg/day for 10 days and then 0.28 mg/kg/day. The longest treatment period was 30 days, with the average prednisone treatment period being 26.8 days and the average placebo treatment period being 26.6 days. Liver biopsies and periodic liver function tests were performed. Although there was no significant difference in bilirubin levels between the prednisone and placebo groups either before treatment or in the first few weeks of treatment, the decrease in hyperbilirubinemia after 3 weeks was significant in both groups. Liver histology and function, as well as the period of convalescence, were similar in both groups. These results indicate that prednisone has no appreciable effect on the course of epidemic hepatitis.

1631 **AN OUTBREAK OF INFECTIVE HEPATITIS WITHIN THE CAMPUS OF CALCUTTA HOSPITAL.** *(E.)* Bhattacharji, L. M. (All-India Inst. Hyg. Publ. Hlth., Calcutta), D. N. Sengupta, G. C. Pain, S. Mukherjee and N. Mazumder. *Indian J Med Res* 56(10):1443-1455, 1968.

1632 **INDICATIONS FOR CORTICOSTEROID THERAPY IN PATIENTS WITH INFECTIOUS HEPATITIS AND DIABETES MELLITUS.** *(Rum.)* Gavrilă, I. (Inst. Med. Pharm., Cluj, Romania), M. Gidaly, R. Josan and C. Pîrvu. *Med Intern (Bucur)* 20(9):1091-1098, 1968.

1633 **CAN CHRONIC GALLBLADDER DISEASE FOLLOW EPIDEMIC HEPATITIS?** *(Rum.)* Zălaru, M. C. (Student Polyclin., Bucharest, Romania). *Med Intern (Bucur)* 20(10):1219-1229, 1968.

1634 **EXCHANGE TRANSFUSION AND/OR PERITONEAL DIALYSIS IN THE TREATMENT OF HEPATIC COMA DUE TO ACUTE HEPATITIS.** *(Sp.)* Velasco, M. (Salvador Hosp., Santiago, Chile), E. Roessler and R. Katz. *Rev Med Chile* 96(6):393-398, 1968.

1635 **DISTRIBUTION OF CERTAIN ENZYMES IN THE SUBCELLULAR STRUCTURES OF THE LIVER IN EPIDEMIC HEPATITIS.** *(Rus.)* Semendiaieva, M. Ie. (Inst. Biol. Med. Chem., Acad. Med. Sci. USSR, Moscow), T. M. Guseva and A. V. Shul'ga. *Ter Arkh* 40(10):59-62, 1968.

1636 **CHANGES IN THE GAS COMPOSITION OF THE BLOOD IN VIRAL HEPATITIS (BOTKIN'S DISEASE).** *(Rus.)* Bezuglyi, V. P. (All-Union Sci.-Res. Inst. Hyg. Toxicol. Pesticides, Kiev, USSR). *Ter Arkh* 40(10):66-71, 1968.

1637 **DETOXIFYING ACTION OF NEOCOMPENSAN IN PATIENTS WITH INFECTIOUS HEPATITIS.** *(Rus.)* Krylova, O. M. (Leningrad Inst. Sanit. Hyg. Med., USSR), S. A. Smirnova and I. M. Khlebnikova. *Ter Arkh* 40(10): 71-74, 1968.

1638 **CHANGES IN THE DEGREE OF OXYGEN SATURATION IN THE BLOOD OF PATIENTS WITH INFECTIOUS HEPATITIS.** *(Rus.)* Strelov, P. I. (Leningrad Inst. Postgrad. Med., USSR) and Iu. M. Argov. *Ter Arkh* 40(10):74-76, 1968.

1639 **ACETYLATING CAPACITY OF THE BODY DURING INFECTIOUS HEPATITIS IN CHILDREN.** *(Rus.)* Sankina, N. V. (Inst. Pediat., Acad. Med. Sci. USSR, Moscow), A. G. Bokovoi and M. Kh. Ismailova. *Pediatriia* 47(11):12-17, 1968.

1640 **EFFECTIVENESS OF THE CLIMATIC-BALNEOLOGICAL TREATMENT OF CHRONIC HEPATITIS AND PRECIRRHOSIS OF THE LIVER IN CHILDREN.** *(Rus.)* Makarov, A. P. (Children Dis. Society, Essentuki, USSR). *Pediatriia* 47(11):17-19, 1968.

1641 **PATHOGENESIS OF EPIDEMIC HEPATITIS IN INFANTS.** *(Rus.)* Kuz'micheva, A. T. (Leningrad Pediat. Med. Inst., USSR), L. A. Mikhailova and O. M. Kuryleva. *Pediatriia* 47(11):36-39, 1968.

1642 **TREATMENT OF ACUTE HEPATITIS.** *(E.)* Grady, G. F. (Tufts U. Sch. Med., Boston, Mass.) and T. C. Chalmers. *Mod Treatm* 6(1):123-130, 1969.

1643 **OBSERVATIONS ON THE BEHAVIOR OF THE SERUM TRANSAMINASES DURING VIRAL HEPATITIS.** *(It.)* Barghini, G. (Inst. Hyg., U. Pisa, Italy), R. Catassi and P. L. Ferrara. *Ann Sclavo* 10(2):145-159, 1968.

1644 **THE PROGNOSTIC VALUE OF CERTAIN IMMUNOELECTROPHORETIC CHANGES IN THE SERUM PROTEINS DURING VIRAL HEPATITIS.** *(Fr.)* Gavrila, I. (Infect. Dis. Clin., Cluj, Romania) and C. Pirvu. *Sem Hop Paris* 44(54):3375-3382, 1968.

1645 **THE TREATMENT OF VIRAL HEPATITIS.** *(E.)* Spellberg, M. A. (Michael Reese Hosp., Chicago, Ill.). *Amer J Gastroent* 51(1):15-34, 1969.

See also: 1221,1225

1646 **ALLEVIATION OF DIETARY CIRRHOSIS WITH BETAINE AND OTHER LIPOTROPIC AGENTS.** *(E.)* Best, C. H. (Banting & Best Dept. Med. Res., U. Toronto, Ontario, Canada), J. H. Ridout and C. C. Lucas. *Canad J Physiol Pharmacol* 47(1):73-79, 1969.

Male rats fed a low-protein hypolipotropic regimen (9% protein provided as 6% extracted peanut meal, 6% soy protein) developed moderately severe cirrhotic lesions in 4-6 months. Various groups then received 11 different treatment diets for about 7 months. In a preventive study, rats fed the basal diet supplemented with choline (0.50%) survived more than 1 yr, gained weight and had normal livers. Supplementary betaine (0.63%) with a diet containing 9% protein (96 mg% methionine) produced marked regression of the cirrhotic condition in 4 and slight improvement in 4 out of 10 rats, but appeared to be more effective when the dietary protein was more adequate (20% protein, 260 mg% methionine), causing marked improvement in 8 and slight improvement in 3 of 12 animals. Under the latter conditions betaine was as beneficial as supplementary choline (0.65%), which resulted in marked improvement in 10 of 12 animals. Supplementary choline (0.65%) with a 9% protein diet containing 96 mg% methionine slightly improved 1 and markedly improved 5 of 6 rats. Even 20% protein in the diet, when this was of poor quality (with 260 mg% methionine), allowed the cirrhotic condition to worsen in all 11 rats. A "good" 20% protein regimen containing 520 mg% methionine was no more beneficial (5 of 8 worsened). Supplementation of the methionine-poor 20% protein diet with choline (0.65%) resulted in marked improvement in the cirrhosis in 8 of 15 animals. Lesions worsened in 3 of 5 rats fed a ration with 9% protein (96 mg% methionine) and in 10 of 10 rats given the diet with 20% protein (260 mg% methionine), but a diet rich in protein of high quality (40%, 950 mg% methionine) effected marked regression of the cirrhosis in 5 of 7 rats. This was as effective as the same mixture with added choline (0.65%; 7 of 9 markedly improved). Supplementary methionine (0.69%) had a marked therapeutic effect when added to the methionine-rich basal diet low in protein (9%; 7 of 10 rats markedly improved) or to the one with 20% protein and 950 mg% methionine. It is suggested that a well-balanced diet would have greater clinical efficacy in the treatment of cirrhosis of dietary origin than a pill containing lipotropic agents.

1647 **PLASMA AND URINARY AMINO ACIDS IN LAENNEC'S CIRRHOSIS.** *(E.)* Zinneman, H. H. (VA Hosp., Minneapolis, Minn), U. S. Seal and R. P. Doe. *Amer J Dig Dis* 14(2):118-126, 1969.

Plasma amino acid concentrations and urinary excretion of free amino acids were measured by ion-exchange chromatography in 7 patients with Laennec's cirrhosis from the stage of precoma to maximal improvement in liver function. Only 3 of 22 amino acids measured showed statistically significant changes during the observation period: taurine (2.8 to 5.1 µmoles/100 ml), citrulline (2.6 to 3.2 µmoles/100 ml), and α-amino-n-butyric acid (2.4 to 1.7 µmoles/100 ml). However, these changes were within the normal range of plasma amino acid concentrations, based on the levels in 24 normal males. The plasma concentrations of amino acids in these patients failed to show the diurnal variation described for tyrosine, phenylalanine, and tryptophan in normal individuals. Decreased plasma concentrations of valine, leucine, and isoleucine pointed to a component of steatonecrosis, confirmed by liver biopsy and measures of liver function. The urinary excretion of threonine, serine, asparagine/glutamine, alanine, ethanolamine, and histidine was increased significantly during hepatic decompensation when compared to the excretion values at maximal compensation; however, the changes were within the normal range. General aminoaciduria observed in 3 cirrhotics after portacaval shunting was thought to be a consequence of the surgical procedure. The failure of this study to detect significant general aminoaciduria in severe Laennec's cirrhosis is in contradiction to some earlier publications.

1648 **ALBUMIN SYNTHESIS IN CIRRHOTIC SUBJECTS WITH ASCITES STUDIED WITH CARBONATE-^{14}C.** *(E.)* Rothschild, M. A. (VA Hosp., New York, N. Y.) M. Oratz, D. Zimmon, S. S. Schreiber, I. Weiner and A. V. Caneghem. *J Clin Invest* 48(2):344-350, 1969.

In 19 acutely ill alcoholics (35-71 yr old) with large amounts of ascites and chemical evidence of gross hepatic dysfunction, the rate of albumin synthesis was studied by the use of ^{14}C-labeled arginine (guanido carbon), as previously described. The confirmed diagnosis (liver biopsy or autopsy) was cirrhosis in 18 cases and acute alcoholic hepatitis with fatty degeneration in 1 patient. The absolute rate of synthesis was less than 105 mg/kg/day in 7 patients and 203-378 mg/kg/day in 7 patients; liver function studies were compared in these 2 groups. Serum albumin levels (1.7 and 2.1 g%) and globulin levels (4.4 and 4.6 g%) were not statistically different in the low and high synthesis groups. The bilirubin level in the low albumin producers was twice that in the high albumin producers, but the mean values (12.5 and 5.2 mg%, resp.) did not differ significantly, due to a wide range of values. No significant difference was noted in the levels of alkaline phosphatase (20 and 26 King-Armstrong U resp.). On prothrombin time prolongation between the 2 groups. In the low albumin group, cholesterol esters averaged 69 mg% (43% of the total cholesterol) while in the high albumin group, they averaged 114 mg% (64% of the total cholesterol); a similar difference was found in the SGOT levels: 147 ± 28 and 65 ± 18 Sigma U in the low and high albumin groups, resp. It is concluded that the serum albumin level, which represents the net results of degradation, synthesis, and distribution, is a good index of neither the hepatic albumin synthesizing capacity nor the over-all functional capacity of the liver in cirrhosis.

1649 **INVESTIGATIONS ON THE FIBRINOLYTIC SYSTEM IN LIVER CIRRHOSIS.** *(E.)* Tytgat, G. (Dept. Med., U. Louvain, Belgium), D. Collen, R. De Vreker and M. Verstraete. *Acta Haemat* 40(5):265-274, 1968.

The fibrinolytic activity (blood plasminogen activator activity) in the plasma and euglobin fraction, as well as antiplasmin levels, were determined on venous blood samples taken before and 15, 30, and 60 min after the rapid i.v. injection of nicotinic acid in 25 cirrhotics (in various stages of the disease) and 25 matched normal controls, in order to evaluate the activation of the fibrinolytic system by nicotinic acid. The calculated mean *in vivo* 50% disappearance time of activator was 13.8 min for the controls and 24.5 min for the cirrhotics, indicating an abnormal delay in hepatic clearing of plasminogen activator in the cirrhotics. A highly significant difference between the mean antiplasmin content in the normal controls (311 U/ml) as compared to the cirrhotics (192 U/ml) was noted. Decreased antiplasmin levels in cirrhotics may potentiate the tendency of these patients to develop plasma fibrinolytic activity.

1650 **CLINICAL AND STATISTICAL OBSERVATIONS ON THE USE OF TRIAMTERENE IN CIRRHOSIS WITH ASCITES.** *(It.)* Cairella, M. (Inst. Systematic Med. Ther., U. Rome, Italy), M. De Martiis and G. Nasta. *Clin Ter* 46(3): 199-202, 1968.

Of 178 patients with cirrhosis and ascites who were treated during a 10-yr period, 105 received various diuretics, including 17 who were given triamterene alone, 16 who were given triamterene and thiazides, and 17 who were given triamterene and other diuretics. The average number of days between paracenteses was 93-100 for these 50 patients, compared to 16-58 days for the other 55. The χ^2-test showed that triamterene significantly reduced the number of patients in whom ascites was clinically evident on discharge (only 14 of 50 compared to 28 of 55 patients on other diuretics).

1651 **IMMUNOSUPPRESSANTS IN THE TREATMENT OF HEPATIC CIRRHOSIS: PERSONAL EXPERIENCE.** *(Fr.)* Laurent, J. (Hosp. Ctr., U. Nancy, France), C. Mauuary, M. Bas, D. Vautrin, P. Drouin, P. Gaucher and F. Heully. *Acta Gastroent Belg* 31(11):780-785, 1968.

Of 13 patients (4 men and 9 women, aged 33-62 yr) with chronic liver disease, 6 had posthepatitic cirrhosis, 6 had alcoholic or meta-icteric cirrhosis, and 1 had primary biliary cirrhosis. Five of these patients were given 4-6 mg/day of chlorambucil and 8 received 100-200 mg/day of azathioprine. Treatment continued for 22-120 days. Liver biopsies revealed that fibrosis had completely disappeared in 2 of the 6 patients with posthepatitic cirrhosis and improvement in liver function tests was noted in 3 others. One woman with decompensated dysglobulinemic cirrhosis of unknown etiology responded well to therapy, but only slight improvements occurred in 2 of the 7 remaining patients. Three patients, all of whom were given azathioprine, developed a photoallergy, reversible thrombopenia and agranulocytosis, and reversible leukopenia, resp. Best results were obtained with patients in the early stages of cirrhosis.

1652 **LYMPH CIRCULATION IN HEPATIC CIRRHOSIS: EFFECT OF PORTACAVAL SHUNT.** *(E.)* Witte, M. H. (Washington U. Sch. Med., St. Louis, Mo.), A. E. Dumont, W. R. Cole, C. L. Witte and K. Kintner. *Ann Intern Med* 70(2): 303-310, 1969.

Thoracic duct lymph was examined in 84 patients with nutritional or postnecrotic cirrhosis (41 with previous esophageal variceal hemorrhage and 4 with portal vein occlusion) and in 7 patients after portacaval shunt and compared with thoracic and regional (liver and small intestine) lymph obtained from 43 normal patients without liver disease and 8 patients with cirrhosis and portal hypertension. In patients with cirrhosis and portacaval shunts, thoracic duct lymph flow and end pressure were markedly higher (6.8 ml/min and 28.0 cm H_20, resp.) than control values (0.82 ml/min and 11.6 cm H_20, resp.). Lymph protein levels, expressed as a % of the plasma level, were 34% in patients who had, and 57% in those who had not, bled from esophageal varices compared with a control value of 72%. The 45-min BSP levels in thoracic duct lymph (% of plasma level) were higher in patients who had never bled from varices (70%) than in those who had prior bleeding (29%) or those with superimposed portal vein occlusion (21%). In control patients with cirrhosis and portal hypertension, total protein concentration in small intestine lymph was markedly reduced, while liver lymph remained high. Protein content in thoracic duct lymph was intermediate between that of liver and small intestine lymph. Total BSP concentration in liver lymph was higher than in thoracic duct lymph, which was, in turn, higher than in small intestine lymph. One to 31 days after portacaval shunt, thoracic duct lymph flow was lower (2.0 ml/min) than in unshunted patients with (7.7 ml/min) or without (6.2 ml/min) a history of variceal bleeding. Shunt patients also showed higher lymph portein (4%) and 45-min BSP levels (47%) than unshunted patients who had bled from varices (3% and 29%, resp.) and patients with occluded shunts (24% and 17%, resp.). Portal pressure fell (36 to 22 cm H_20) following portacaval shunt, and thoracic duct lymph flow fell to 29% of the preshunt level (6.3 to 1.8 ml/min); lymph protein and 45-min BSP increased 86% and 97%, resp. These findings suggest that when postsinusoidal obstruction predominates in cirrhosis, the major source of excess thoracic duct lymph is the liver sinusoids. When presinusoidal obstruction prevails, the extrahepatic portal bed is the major source of excess throacic duct lymph and ascitic fluid. A portacaval shunt minimizes the formation of excess lymph in the extrahepatic portal bed and may also reduce the formation of liver lymph.

1653 **A FAMILY WITH CONGENITAL HEPATIC CIRRHOSIS.** *(Ger.)* Korth, K. (Norderdithmarsche Dist. Hosp., Heide, Germany), C. A. Sager, H. J. Brunck and W. Lehmann. *Med Welt* 19(49):2704-2709, 1968.

A family is reported in which 6 of 7 siblings, including a half sister, developed jaundice during the first few weeks after birth. Four died and 2 recovered. One child died reportedly of a congenital heart defect and another of an infection of the navel and paralytic ileus. In the latter case, however, the presence of jaundice and hepatomegaly suggested severe hepatocellular damage. Both parents and the maternal grandparents were clinically normal and the parents had no history of jaundice. The maternal grandmother, however, developed jaundice after the birth of her last child, and all 3 maternal uncles as well as 1 maternal aunt died 1-3 months after birth of undetermined causes. Possible etiological factors which were ruled out in this family included toxoplasmosis, listeriosis, cytamegalic inclusion disease, cystic fibrosis, congenital biliary atresia, erythroblastosis fetalis, Wilson's disease, disturbances in lipid metabolism, galactosemia, glycogenosis, Crigler- Najjar syndrome, milk intolerance, chromosome aberrations, and congenital liver anomalies. It is suggested that cirrhosis was produced by anomalies in the metabolism of the hepatic parenchyma.

1654 **THE SIGNIFICANCE OF HYPERAMMONEMIA OF RENAL ORIGIN IN THE PATHOGENESIS OF HEPATIC COMAS PRODUCED IN CIRRHOTICS BY DIURETICS WHICH CAUSE HYPOKALEMIA.** *(Fr.)* Imler, M. (Hosp. Ctr., U. Strasbourg, France), R. Bockel, B. Peter, R. Kieny and J. Stahl. *Path Biol (Paris)* 17(1/2):5-19, 1969.

Of 28 patients with alcoholic cirrhosis, 21 were given 100-200 mg/day of chlortalidone p.o., 2 were given ethacrynic acid, 1 furosemide, and 4 acetazolamide. In almost all cases an increase in arterial ammonia levels was associated with hypokalemia. Extracellular alkalosis also occurred frequently but was not observed in any of the patients receiving acetazolamide since this drug produced a simultaneous decrease in blood pH and plasma bicarbonates. Neurological symptoms similar to those seen before the onset of hepatic coma developed in 9 patients with arterial ammonia levels above 120 μg%. Eight of these were receiving chlortalidone. However, these patients did not have more pronounced electrolyte or acid-base disturbances than cirrhotics who did not develop neurological symptoms. Elevations in arterial ammonia levels were caused by an increase in the amount of ammonia which the kidneys emptied into the renal veins. Liver and muscle tissue were not implicated in hyperammonemia. Increases in ammonia levels in the renal vein, caused by hypokalemia, were not accompanied by clear-cut changes in urinary ammonia excretion. When cirrhotics are treated with diuretics, hypokalemia and the alkalosis which often accompanies it can be rapidly reversed by administering potassium salts and antibiotics.

1655 **CHANGES IN LYSOSOMAL AND MICROSOMAL ENZYME ACTIVITIES IN HUMANS WITH HEPATIC CIRRHOSIS.** *(It.)* Gualà, L. (Inst. Med. Symptomatol., U. Naples, Italy). *Fegato* 14(4):593-604, 1968.

Liver biopsies were made on 4 controls and 9 subjects (4 men and 5 women, aged 23-58 yr) with cirrhosis. These included 5 with portal cirrhosis, 2 with Banti's disease, 1 with hepatic sclerosis, and 1 with Cruveilhier-Baumgarten's disease. Assays of enzyme activities in liver homogenates showed that absolute decreases had occurred in total, free, and bound acid phosphatase; DNAse and RNAse; and glucose-6-phosphatase, an indicator of microsome activity. However, considerable increases were noted in the cell population density so that a relative increase occurred in RNAse activity. DNAse activity remained unchanged. It is concluded that lysosomal membranes are damaged in cirrhosis.

1656 **EFFECTS OF AMILORIDE (MK 870) ON WATER AND ELECTROLYTE METABOLISM IN CIRRHOTIC PATIENTS WITH ASCITES.** *(Fr.)* Vesin, P. (Argenteuil Hosp., France), A. Roberti and R. Viguie. *Schweiz Med Wschr* 99(1):21-26, 1969.

1657 **TRIAL OF CHLORAMBUCIL IN THE TREATMENT OF PRIMARY BILIARY CIRRHOSIS.** *(Fr.)* Pergola, F. (96 Ave. Victor Hugo, Paris, France), M. Cachin and P. Galian. *Acta Gastroent Belg* 31(11):791-794, 1969.

1658 **IMMUNOLOGIC ASPECTS OF PORTACAVAL SHUNT IN HEPATIC CIRRHOSIS.** *(Fr.)* Mazzoni, G. (Munic. Hosp., Valmontone, Rome, Italy), A. Valli and A. Demofonti. *Acta Gastroent Belg* 31(11):795-797, 1968.

1659 **SPLEEN AND OMENTUM AS AN ACCESSORY SOURCE OF BLOOD SUPPLY TO THE CIRRHOTIC LIVER.** *(Pol.)* Mastyńska, M. (Acad. Med., Poznan, Poland) and P. Stajgis. *Pol Przegl Chir* 50(1):19-22, 1969.

1660 **CLINICAL AND BIOCHEMICAL STUDIES OF THE USE OF MK 870 (AMILORIDE HYDROCHLORIDE), A NEW NATRICHLORURETIC AGENT WITH ANTIKALIURETIC ACTIVITY, IN THE TREATMENT OF CIRRHOTOGENIC ASCITES.** *(Sp.)* Schmukler, B. (Durand Hosp., Ciudadela, Buenos Aires, Argentina), S. Bisio, E. Iovine and B. A. Cervini. *Prensa Med Argent* 55(30):1442-1446, 1968.

1661 **SPONTANEOUS GROUP B STREPTOCOCCAL BACTEREMIA COMPLICATING HEPATIC CIRRHOSIS: REPORT OF TWO CASES.** *(E.)* Ginsberg, M. D. (Boston City Hosp., Mass.). *Amer J Dig Dis* 13(12):1065-1071, 1968.

1662 **URINARY MAGNESIUM EXCRETION AFTER ORAL DIURETIC THERAPY IN PATIENTS WITH CIRRHOSIS OF THE LIVER: ITS MODIFICATION BY VASOPRESSIN.** *(Sp.)* Bardi, A. (J. J. Aguirre Hosp., Santiago, Chile), I. Merino, Y. Rendic, G. Generini and M. Plaza de los Reyes. *Rev Med Chile* 96(6):415-419, 1968.

1663 **REMARKS ON THE TREATMENT OF EDEMATOUS AND ASCITIC SYNDROMES OF HEPATIC ORIGIN: THE USE OF AN ANTIALDOSTERONE.** *(Fr.)* Levrat, R. (Red Cross Hosp., Lyon, France), B. Savoye and D. Imbert. *J Med Lyon* 49(1154):1887-1898, 1968.

1664 **MACROGLOBULINEMIA IN HEPATIC CIRRHOSIS.** *(Ger.)* Schneiderbaur (Lainz Hosp., Vienna, Austria) and F. Rettenbacher. *Wien Med Wschr* 119(8):157-161, 1969.

1665 **PATHOLOGICAL STUDY OF THE HEART IN CIRRHOSIS OF THE LIVER: THE RESULTS OF MACROSCOPIC AND LIGHT AND ELECTRON MICROSCOPIC STUDIES IN 120 CASES.** *(Fr.)* Auzépy, P. (Bicetre Hosp., Paris, France), J. Paillas, Y. Grosgogeat, G. Manigand and M. Deparis. *Ann Med Intern* 120(1):49-59, 1969.

1666 **PLASMA LIPIDS DURING TREATMENT OF LIVER CIRRHOSIS.** *(Pol.)* Milewski, B. (2nd Clin. Intern. Dis., Inst. Postgrad. Med., Warsaw, Poland) and S. Wojnar. *Pol Arch Med Wewnet* 41(5):627-631, 1968.

1667 **REINFUSION OF BLOOD FROM THE SPLEEN, REMOVED FOR CIRRHOSIS OF THE LIVER AND PORTAL HYPERTENSION.** *(Rus.)* Lytkin, M. I. (S. M. Kirov Acad. Milit. Med., Leningrad, USSR) and V. I. Sidorenko. *Probl Gemat* 14(1):28-30, 1969.

1668 **CALCIFIED COLLATERAL VEINS AND GROSS DILATATION OF THE AZYGOS VEIN IN CIRRHOSIS. [CASE REPORT]** *(E.)* Blendis, L. M. (King's Coll. Hosp., London, England), J. W. Laws, R. Williams and W. B. Thompson. *Brit J Radiol* 41(492):909-912, 1968.

1669 **PARADOXICAL INCREASE IN POTASSIUM EXCRETION DURING SPIRONOLACTONE TREATMENT OF TWO PATIENTS WITH CIRRHOSIS OF THE LIVER.** *(Hun.)* Radó, J. (Janos Hosp., Budapest, Hungary) and L. Szende. *Magy Belorv Arch* 21(6):305-308, 1968.

1670 **CHRONIC ENCEPHALOMYELOPATHY DUE TO HEPATIC CIRRHOSIS: REPORT OF 2 CASES.** *(Turk.)* Dilsen, N. (Med. Fac., U. Istanbul, Turkey), I. Ulagay, M. Yenerman, Y. Pekcelen, E. Aktin and G. Dilsen. *Turk Tip Cem Mec* 34(10):607-618, 1968.

1671 **CYANOSIS, CLUBBED FINGERS, AND A HEART MURMUR: A CONGENITAL CYANOTIC HEART DEFECT OR HEPATIC CIRRHOSIS?** *(It.)* Jacono, A. (Inst. Spec. Med. Path., U. Naples, Italy), C. Buonanno, B. Carelli and C. Zappacosta. *Policlinico [Prat]* 75(48):1569-1578, 1968.

1672 **TREATMENT OF PRIMARY BILIARY CIRRHOSIS.** *(E.)* Schaffner, F. (Mount Sinai Sch. Med., City U. New York, N. Y.). *Mod Treatm* 6(1):205-214, 1969.

1673 **MANAGEMENT OF COMPLICATIONS OF PORTAL HYPERTENSION.** *(E.)* Britton, R. C. (Dept. Surg., Brooklyn-Cumberland Med. Ctr., N. Y.). *Mod Treatm* 6(1):175-190, 1969.

1674 **TREATMENT OF ALCOHOLIC CIRRHOSIS.** *(E.)* Leevy, C. M. (New Jersey Coll. Med., East Orange). *Mod Treatm* 6(1):165-174, 1969.

See also: 1215,1289,1291,1640

1675 **BENIGN STENOSIS OF THE HEPATIC DUCT: REPORT OF 17 CASES.** *(Fr.)* Toader, C. *Bull Soc Int Chir* 27(4):299-304, 1968.

In 1037 operations on the biliary tract, 89 hepatobiliary stenoses were found, most of which were noncancerous and 24 of which involved the hepatic duct. These 24 cases included 17 primary stenoses and 7 secondary ones (3 posttraumatic and 4 posthydatid). Of the 17 patients with primary stenoses (9 men and 8 women), 8 had symptoms of viral hepatitis followed by those of obstructive jaundice. At surgery the hepatic duct was usually sclerotic, but was pseudocancerous in 3 cases. Progressive dilatation of the stenosis produced a flow of bile or bile mixed with pus (2 cases). Sclerotic tissue was removed, a hepatoplasty was performed, and a Kehr drain was inserted. Biliary cirrhosis was present in 8 cases. Hydatid cysts were found at a considerable distance from the hilum in 3 cases. These cysts might favor lesions in the hepatic duct, but biliary stasis and cholangitis resulting from stenosis favor the infection of hydatid cysts. Cholelithiasis was present in 4 cases and choledocholithiasis in 1. In 3 cases stenosis of the hepatic duct was associated with sclerotic odditis; sphincteroplasties and hepaticoplasties were performed. In 1 patient who died of liver failure 5 days after surgery, stenosis of the hepatic duct was associated with stenosis of the common bile duct above the duodenum. All other patients recovered.

1676 **CHOLEDOCHODUODENOSTOMY.** *(E.)* Kazmers, N. (Lakeview Med. Clin., Mich). *J Abdom Surg* 11(1):15-20, 1969.

Based on experience with 500 biliary tract operations, including 28 biliodigestive anastomoses, as well as 259 cases subjected to routine operative cholangiography and 93 common bile duct explorations, 14 patients (5 men and 9 women, 42-88 yr old) treated by latero-lateral choledochoduodenostomy are reported in detail and the indications for this procedure are evaluated. Cholecystectomy was performed in 8 of these cases. The causes of obstruction were choledocholithiasis with complete (4 cases) or incomplete (4) obstruction, fibrous stenosis of the papilla of Vater (4), including 1 with intermittent and 3 with incomplete obstruction, suspected carcinoma of the head of the pancreas with complete ductal obstruction (1), and carcinoma of the head of the pancreas with metastases to the liver and complete obstruction of the common hepatic duct and the lower portion of the common bile duct (1). The immediate postoperative course was uneventful in all but 1 case. Duodenobiliary reflux was demonstrated radiographically in all patients. A review of the literature revealed that the most frequent complication of choledochoduodenostomy is stricture of the stoma; fistula formation, blind sac syndrome and intolerance of duodenobiliary reflux are very rare. Properly performed choledochoduodenostomy is an excellent procedure for curative or palliative decompression of the biliary tree. This procedure is the treatment of choice for recurrent intra- and/or extrahepatic duct stones, fibrotic stenosis of the papilla of Vater, or stenosis of the distal portion of the common bile duct. As a palliative procedure in jaundice due to carcinoma of the distal part of the common duct and the head of the pancreas, it is preferable to cholecystoduodenostomy or cholecystojejunostomy because of relatively frequent obstruction of the cystic duct from inflammatory stricture or simple kink.

1677 **GALLBLADDER DISEASE AND CHOLECYSTECTOMY: EXPERIENCE WITH 1500 PATIENTS MANAGED IN A COMMUNITY HOSPITAL.** *(E.)* Briele, H. A. (Peninsula Gen. Hosp., Salisbury, Md.), W. B. Long and L. C. Parks. *Amer Surg* 35(3):218-222, 1969.

The diagnostic and pathologic findings and pre- and postoperative management of 1500 patients (17-94 yr old; 62.8% women) operated on for biliary tract disease during the period April 1946-August 1963 are reviewed. A preoperative diagnosis of cholelithiasis or acute or chronic cholecystitis was made on the basis of the patients history and cholecystography. Antibiotic therapy was used routinely in patients with acute cholecystitis (penicillin, streptomycin, tetracycline, chloramphenicol). The findings at laparotomy included: normal gallbladder (32 cases), chronic cholecystitis (1079), acute cholecystitis (321), pancreatitis (28), gallbladder cancer (23), hepatoma (4), pancreatic cancer (7), common duct cancer (1), and liver metastasis from occult carcinomas (5). Silent stones were present in 4.5% of those operated on. Cholecystectomy was performed in 70.9%, cholecystectomy and, choledochostomy in 12.1%, cholecystostomy in 10.1%, sphincterotomy in 2.6% and exploration in 4.3% of the cases. There were 27 operative deaths (within 30 days of the surgery) and 115 instances of postoperative complications. Cardiovascular and pulmonary complications were more frequent in older patients; younger patients suffered infections whose incidence was correlated with the severity of the cholecystitis. All deaths occurred in patients over 50 yr old and 61% in those over age 60. Patients with diabetes are especially vulnerable to the complications of cholelithiasis. Early surgical intervention is indicated as a means of reducing the morbidity and mortality of cholecystitis in the elderly and in those with progressive medical diseases (arteriosclerosis, pulmonary insufficiency, diabetes, compensated renal failure).

1678 **CARCINOMA OF THE GALLBLADDER: REPORT OF 24 CASES.** *(Gr.)* Drosos, N. P. (Surg. Teach. Clin., U. Athens, Greece) and K. N. Khourdakis. *Acta Chir Hellen* 95(4):455-475, 1968.

Among 1246 patients operated on for biliary tract diseases during the period 1950-66, 36 were found to have primary malignancies of the extrahepatic biliary tract and 24 of these (4 men and 20 women, average age 67 and 61 yr, resp.) had carcinoma of the gallbladder; there were 23 adenocarcinomas and one case of malpighian-cell carcinoma. There was a history of cholelithiasis in 21 cases. The results of simple cholecystectomy were considered to be poor, although the 5 patients treate in this way survived for 1.5-3 yr. Survival was 19 months and 3 yr in 2 patients treated by cholecystectomy plus right hepatic lobectomy, while 6 patients subjected to laparotomy only died in 7-40 days and 3 treated in the procedure of Longmire or Longmire-Hepp died in 2-7 days in hepatic coma. It is conclude that the excision should always include a portion of the contiguous liver and lymph nodes, and that right hepatic lobectomy is the method of choice, even in the presence of hepatic metastasis, provided only that the left lobe is macroscopically normal. The literature on the etiology, pathology, diagnosis and surgical treatment of gallbladder carcinoma is reviewed in detail (61 refs.).

1679 **SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS WITH ASSOCIATED DUCTAL CHOLELITHIASIS.** *(Pol.)* Sierko, S. (J. Sniadecki Distr. Hosp., Bialystok, Poland), A. Dowgird and E. Bernacki. *Pol Przegl Chir* 40(11):1342-1347, 1968.

Ductal cholelithiasis was diagnosed preoperatively in 95 patients (13 men and 82 women, average age 53.5 yr) among 446 (75 men and 371 women, average age 52 yr) subjected to surgery for acute cholecystitis; the patients with ductal lithiasis included 44 of the 83 with jaundice. The most valuable diagnostic procedure was operative cholangiography, although false-negative cholangiograms were obtained in 3 patients with stones in the common duct. Treatment was by cholecystostomy in 6 cases (one of which also received choledocholithotomy and drainage) and by cholecystectomy in 89 (plus choledocholithotomy and drainage in 46, choledochoduodenostomy in 22, sphincterotomy and drainage in 11, sphincterotomy and suture in 7, and choledochoduodenostomy plus sphincterotomy in 3). There were 7 deaths among the 95 positive cases (7.3%) compared to 9 deaths among the 351 others (2.6%), but this is not ascribed to the more extensive surgery since all those who died were over 60 yr of age and 5 were over 70. All the deaths were among those treated by choledocholithotomy or choledochoduodenostomy. Complications developed in 28 of the 95 cases and the average hospital stay was prolonged from 20.4 days to 29.3 days.

1680 **RELATIONS BETWEEN CHOLESTEATOSIS AND CHOLECYSTITIS.** *(Ger.)* Zschoch, H. (Inst. Path., Distr. Hosp., Brandenburg, Germany). *Zbl Chir* 93(51):1761-1766, 1968.

A histological study was made of 43 gallbladders with cholesteatosis obtained at autopsy and 363 gallbladders obtained during surgery (181 with and 182 without cholesteatosis). Inflammation was found in 90-97.8% of the resected gallbladders, with or without cholesteatosis, but in only 4.6% of the gallbladders obtained at autopsy. The chronic form of inflammation was found in 57-58% of resected gallbladders with or without cholesteatosis, and the persistent type in 32-39.5%. Mild degrees of both forms of inflammation were more commonly found in gallbladders with cholesteatosis. Cholelithiasis was found in 87% of the resected gallbladders with and without cholesteatosis and in only 20% of the autopsied gallbladders. Inflammation was found in 6.3% more often in gallbladders without cholesteatosis and with gallstones than in those with both cholesteatosis and gallstones; this difference was significant. It is therefore more likely that inflammation is produced by cholelithiasis rather than by cholesteatosis. No evidence was found to indicate whether inflammation favored the development of cholesteatosis or whether cholesteatosis is a pathological condition, particularly in the absence of cholelithiasis and inflammation.

1681 **PERSONAL EXPERIENCE WITH ODDI SPHINCTEROTOMY IN BILIARY TRACT DISEASE: REPORT OF A HOMOGENEOUS SERIES OF 240 CASES.** *(Fr.)* Stoppa, R. (U. Hosp. Ctr., Amiens, France), J. Seror, J. Rives and J.-J. Prévost. *Ann Chir* 22(23/24):1347-1356, 1968.

The 240 patients subjected to transduodenal sphincterotomy for choledocholithiasis (95 cases), lithiasis of the ampulla (37 cases), sclerotic inflammation of the sphincter of Oddi (61 cases), or acute cholangitis (9 cases), represented 13.6% of the 1764 biliary tract operations carried out during this period. In addition to sphincterotomy by a special technique referred to as "sphincterotomy via a rubber catheter using an electric cautery", almost all the patient also received cholecystectomy and 37 received external drainage. There were 11 deaths (4 due to acute pancreatitis and 7 to unrelated factors) and 4 patients developed mild complications (digestive hemorrhage in 2 and unrelated complications in 2). The 12 cases with postprandial pain who were studied showed no pancreatic involvement, but 59 of 78 liver biopsies showed pathological findings. Among 77 patients followed for at least 18 months, 61 had good-very good results, 15 had fair results, and 1 had a poor result. The duodenobiliary reflux which was sometimes noted was found to be harmless. Sphincterotomy is concluded to be a widely applicable procedure in biliary tract disease.

1682 **THE ROLE OF BIOLOGICALLY ACTIVE SUBSTANCES IN THE MECHANISM OF THE ALLERGIC RESPONSE OF THE GALLBLADDER.** *(Rus.)* Tolpegina, T. B. (S. V. Kurashov Med. Inst., Kazan, USSR). *Pat Fiziol Eksp Ter* 12(6):27-30, 1968.

1683 **CALCULOUS BILIARY TRACT DISEASE.** *(E.)* Glenn, E. (Cornell Med. Ctr., New York, N. Y.). *Oklahoma Med J* 62(1):3-7, 1969.

1684 **THE ASSOCIATION BETWEEN JOINT CHANGES IN THE VERTEBRAE AND DISEASES OF THE BILIARY TRACT AND GALLBLADDER.** *(Rum.)* Jocu, J. (Dr. I. Cantacuzino Hosp., Bucharest, Romania) and E. Ilie. *Med Intern (Bucur)* 20(9):1125-1130, 1968.

1685 **ANICTERIC CHOLELITHIASIS OF THE COMMON BILE DUCT.** *(Pol.)* Czyżewski, K. (1st Surg. Clin., Acad. Med., Wroclaw, Poland), E. Dawiskiba, A. Giermański, L. Oleszkiewicz and K. Świtalska. *Pol Tyg Lek* 24(1):10-12, 1969.

1686 **HETEROTOPIC INCLUSION OF MUCOSA FROM THE GASTRIC FUNDUS IN THE GALLBLADDER WALL.** *(It.)* Bartocci, U. (Inst. Gen. Surg. Clin., U. Rome, Italy) and A. Bertolotti. *Policlinico [Chir]* 75(5):279-288, 1968.

1687 **RESIDUAL GALLSTONES IN THE COMMON BILE DUCT.** *(Fr.)* Lortat-Jacob, J. L. (Beaujon Hosp., Clichy, France), C. A. Richard and R. Giuli. *Ann Chir* 22(25/26):1497-1500, 1968.

1688 **USE OF PRIBRAM'S METHOD FOR RESIDUAL COMMON DUCT STONES.** *(Fr.)* Rettori, R. (Tenon Hosp., Paris, France). *Ann Chir* 22(25/26):1503-1505, 1968.

1689 **RESIDUAL AND RECURRENT GALLSTONES IN THE COMMON BILE DUCT.** *(Fr.)* Edelmann, G. (La Pitié Hosp., Paris, France), P. Boutelier and D. Dumas. *Ann Chir* 22(25/26):1493-1495, 1968.

1690 **DISCUSSION OF 40 CASES OF RESIDUAL STONES OF THE COMMON BILE DUCT.** *(Fr.)*

Roux, M. (Vaugirard Hosp., Paris, France), P. Vayre, J. Hureau, J. C. Levasseur and A. Farah. *Ann Chir* 22(25/26):1515-1518, 1968.

1691 **RESIDUAL STONES IN THE COMMON BILE DUCT: THERAPEUTIC INDICATIONS AND RESULTS.** *(Fr.)* Houdard, C. (Tenon Hosp., Paris, France), M. Deligny and F. Hirschmann. *Ann Chir* 22(25/26):1469-1474, 1968.

1692 **RESIDUAL STONES IN THE COMMON BILE DUCT (STATISTICS AND ETIOLOGY).** *(Fr.)* Garbay, M. (Broussais Hosp., Paris, France) and P. Bouchard. *Ann Chir* 22(25/26):1443-1451, 1968.

1693 **RESIDUAL STONES IN THE COMMON BILE DUCT (STATISTICS AND ETIOLOGY).** *(Fr.)* Combemale, B. (Munic. Hosp., Lille, France) and G. Salazar Tamayo. *Ann Chir* 22(25/26):1453-1455, 1968.

1694 **RECURRENT LITHIASIS OF THE COMMON BILE DUCT.** *(Fr.)* Paris, J. (Hosp. Ctr., U. Lille, France) and Y. Salembier. *Ann Chir* 22(25/26):1461-1467, 1968.

1695 **RECURRENT STONES OF THE COMMON BILE DUCT (STATISTICS AND ETIOLOGY).** *(Fr.)* Larrieu, H. (Broussais Hosp., Paris, France) and F. Adle. *Ann Chir* 22(25/26):1457-1460, 1968.

1696 **SURGICAL TACTICS IN THE TREATMENT OF EXTERNAL BILIARY FISTULAS.** *(Rum.)* Ciobanu, S. (Inst. Med., Timisoara, Romania) and A. Barbu. *Rev Medicochir Iasi* 72(3):651-656, 1968.

1697 **THE TECHNIQUE OF PAPILLECTOMY.** *(Sp.)* Garriz, R. A. (Rawson Hosp., Buenos Aires, Argentina), H. D. Santangelo and J. M. Almanza. *Prensa Med Argent* 55(30):1469-1473, 1968.

1698 **RESIDUAL LITHIASIS AND RECURRENT LITHIASIS OF THE COMMON BILE DUCT.** *(Fr.)* Mouchet, A. (Dept. Gen. Dig. Surg., C. M. C. Foch, Suresnes, France), J. Marquand and M. Guivarc'h. *Mem Acad Chir (Paris)* 94(23/24):693-699, 1968.

1699 **RETROPANCREATIC CANCERS OF THE COMMON BILE DUCT (WITH THE EXCEPTION OF THE AMPULLA OF VATER): REPORT ON 8 CASES TREATED BY PANCREATICODUODENAL RESECTION.** *(Fr.)* Mercadier, M. (La Pitié Hosp., Paris, France), J. P. Clot and G. Grillot. *Ann Chir* 22(21/22):1255-1259, 1968.

1700 **THE ETIOLOGY OF CHOLELITHIASIS.** *(E.)* Harding Rains, A. J. (Charing Cross Hosp., London, England). *J Roy Nav Med Serv* 54(3):178-182, 1968.

1701 **FURTHER STUDIES ON THE EFFECT OF DIETARY ANION EXCHANGERS ON GALLSTONE FORMATION IN HAMSTERS.** *(E.)* Bergman, F. (Dept. Path., U. Umeå, Sweden) and W. van der Linden. *Acta Chir Scand* 134(8):651-654, 1968.

1702 **THE ETIOLOGY, DIAGNOSIS AND MANAGEMENT OF POST-OPERATIVE BILE DUCT STRICTURES WITH A REPORT ON FOUR CASES.** *(E.)* Collins, P. G. (Charitable Infirm., Dublin, Ireland). *J Irish Med Ass* 61(378):429-435, 1968.

1703 **COMPLICATIONS OF CHOLELITHIASIS.** *(E.)* Newman, H. F. (Union Health Ctr., New York, N. Y.), J. D. Northup, M. Rosenblum and H. Abrams. *Amer J Gastroent* 50(6):476-496, 1968.

1704 **SURGICAL TECHNIQUES FOR ACUTE CHOLECYSTITIS IN GERIATRIC PATIENTS.** *(Rus.)* Tregubov, G. S. (S. M. Kirov Med. Inst., Gor'kii, USSR), Iu. A. Kiselev and Che Van Gyn. *Sovet Med* 31(12):33-37, 1968.

1705 **EVACUATION OF THE GALLBLADDER AFTER GASTRECTOMY.** *(Rus.)* Rusanov, A. A. (Leningrad Pediat. Med. Inst., USSR), V. P. Zinevich and B. T. Kats. *Vestn Khir Grekov* 100(10):3-7, 1968.

1706 **THE EFFECTS OF CHRONIC BILIARY TRACT DISEASES WHEN SURGERY IS POSTPONED.** *(Ger.)* Grozinger, K. H. (Surg. Clin., U. Heidelberg, Germany). *Med Welt* 20(8):391-394, 1969.

1707 **BILIARY ILEUS ASSOCIATED WITH VOMITING OF GALLSTONES.** *(Ger.)* Merguet, H. (Surg. Clin., Ruhr U., Essen, Germany). *Med Welt* 20(8):440-441, 1969.

1708 **SPONTANEOUS CHOLECYSTOCOLONIC FISTULA.** *(Ger.)* Kotter, A. (Surg. Clin., U. Saar, Homburg, Germany) and K. Ewe. *Med Welt* 20(8):438-439, 1969.

1709 **BLOOD THROMBI IN THE BILIARY TRACT: A CONTRIBUTION TO THE CAUSE OF HEMOBILIA.** *(Ger.)* Guttsches, O. (Maria Hilf Hosp., Bad Neuenahr, Germany). *Med Welt* 20(8):441-442, 1969.

1710 **GALLSTONE ILEUS AT A COMMUNITY HOSPITAL.** *(E.)* Kelly, T. R. (Akron City Hosp., Ohio) and P. A. Getty. *Ohio State Med J* 65(2):143-146, 1969.

1711 **THE ABNORMAL ECONOMY OF CHOLESTEROL IN THE BILE-FISTULA DOG.** (E.) Pertsemlidis, D. (Rockefeller U., New York, N. Y.) and E. H. Ahrens Jr. *Surg Forum* 19:310-312, 1968.

1712 **REGRESSION AND PREVENTION OF EXPERIMENTAL ATHEROSCLEROSIS: EFFECTS OF DIET AND BILE DIVERSION IN THE DOG.** *(E.)* DePalma, R. G. (Case Western Reserve U. Sch. Med., Cleveland, Ohio), C. A. Hubay, C. J. Vogt Jr., W. Insull Jr., P. H. Hartman and A. V. Robinson. *Surg Forum* 19:308-310, 1968.

1713 **CHRONIC BILIARY OBSTRUCTION: HEMODYNAMIC EFFECTS OF DECOMPRESSION.** *(E.)* Steer, M. L. (VA Hosp., San Francisco, Calif.), A. N.

Thomas, C. T. Rosson, S. A. Ketchum III and A. D. Hall. *Surg Forum* 19:342-344, 1968.

1714 **ENCHANCEMENT OF THE CHOLESTEROL-HOLDING CAPACITY OF HUMAN HEPATIC BILE.** *(E.)* Tompkins, R. K. (Ohio State U. Coll. Med., Columbus), L. Burke, D. G. Cornwell and R. M. Zollinger. *Surg Forum* 19:344-345, 1968.

1715 **CHOLECYSTITIS AND CHOLELITHIASIS IN CHILDHOOD.** *(E.)* Graivier, L. (Child. Med. Ctr., Dallas, Tex.), T. Votteler and G. W. Dorman. *Dallas Med J* 55(3):122-125, 1969.

1716 **BETTER INSTRUMENTS AND TECHNIQUES FOR BILIARY TRACT SURGERY.** *(Sp.)* Preciado Zepeda, J. *Cir Cir* 36(6):610-619, 1968.

1717 **CANINE COMMON BILE DUCT: CHRONOLOGIC CHANGES IN CALIBER AFTER CHOLECYSTECTOMY.** *(E.)* Mahour, G. H. (Mayo Grad. Sch. Med., U. Minnesota, Rochester), K. G. Wakim, D. O. Ferris and E. H. Soule. *Arch Surg* 98(2):239-240, 1969.

1718 **TRANSDUODENAL SPHINCTEROTOMY.** *(Ger.)* Walz, U. M. (Marien Hosp., Stuttgart, Germany). *Langenbeck Arch Klin Chir* 323(1):1-17, 1968.

1719 **LIPIDS IN BLOOD AND BILE FROM THE NORMAL AND THE PERSON WITH CHOLELITHIASIS.** *(E.)* Thorbjarnarson, B. (New York Hosp.-Cornell Med. Ctr., N. Y.). *Arch Surg* 98(3):372-374, 1969.

See also: 1071,1207,1212,1223,1232,1237,1239,1243,1392,1596

1720 STUDY OF 50 PATIENTS WITH A DIAGNOSIS OF ACUTE GASTROENTERITIS ON WHOM ORAL TROPAMYCIN WAS USED. *(Sp.)* Rossi, J. C. (Hosp. Mexican Petroleum Workers, Poza Rica, Veracruz, Mexico). *Medicina (Mex)* 48(1050):662-663, 1968.

Oral Tropamycin (containing 0.77 g neomycin sulfate, 0.008 g oxybutynin hydrochloride, 20 g kaolin, and 1 g pectin/100 ml) was given p.o. to 50 children, aged 15 days to 12 yr, with symptoms of acute gastroenteritis. Depending upon the severity of the symptoms, 30-50 mg/kg/day was administered in 4 or 6 daily doses. In addition, 2 patients were given an antiemetic and 1, another antibiotic. In 48 cases the symptoms disappeared within 24-48 hr. No unpleasant side effects were seen although therapy was continued for 5-10 days. One patient died of aspiration pneumonia several hours after institution of therapy. Another was finally diagnosed as having acute pyelonephritis and responded to a combination of chloramphenicol and Tropamycin.

1721 EFFECTS OF A COMBINATION OF PREDNISOLONE AND VASOPROTECTORS IN GASTROINTESTINAL DISEASE. *(Fr.)* Alary, R. (Red Cross Hosp., Lyon, France), R. Levrat and B. Savoye. *J Med Lyon* 49(1154): 1913-1926, 1968.

Flavipred, a product consisting of prednisolone, hesperidin methyl chalcone and coumarin, was given to 17 patients (14 men and 3 women, aged 46-73 yr) with decompensated alcoholic cirrhosis in doses of 15-30 mg/day for 10-35 days. In addition, all patients were put on a salt-free diet and 2 with ascites received diuretics. Results, based on increases in diuresis, were good in 5 cases, satisfactory in 2, and nil in 10. One patient developed glucosuria and hyperglycemia which disappeared when therapy was discontinued. Flavipred was also given to 12 patients (2 males and 10 females, aged 23-80 yr) with viral hepatitis. Doses of 30-40 mg/day were given for 15-65 days. Results, based on disappearance or regression of jaundice, diuresis, and liver function tests, were good in 11 cases and satisfactory in 1. One patient developed streptococcal septicemia and, later, a cushingoid syndrome which disappeared 1 month after therapy was discontinued. Good or satisfactory results were also obtained in 3 of 5 patients with nonalcoholic cirrhosis, 3 of 3 patients with hemorrhagic rectocolitis, and 0 of 4 patients with gastrointestinal neoplasms. Only 1 patient in this group developed a cushingoid syndrome. Flavipred is recommended as a substitute for corticosteroid therapy alone because of its effectiveness and the low percentage of side effects which occur with its use.

1722 TISSUE ADHESIVE IN INTESTINAL SURGERY. *(E.)* Matsumoto, T. (Walter Reed Army Inst. Res., Washington, D. C.), K. C. Pani, J. J. Kovaric and H. F. Hamit. *Amer Surg* 35(3):210-217, 1969.

A 16-month follow-up study is reported on 83 dogs in which small intestinal anastomosis or serosal patch closure of small intestinal perforation (surgical techniques described elsewhere) was performed with the aid of n-alkyl-alpha-cyanoacrylate monomers. The use of a tissue adhesive aerosol spray in suture line reinforcement during intestinal surgery in dogs was also evaluated. Mortality (2-28 days after surgery) and rate of stenosis of the anastomosed area were highest (4 of 7 and 1 of 7 dogs, resp.) when tissue adhesive was used for inverting anastomoses. When invagination anastomosis was performed with tissue adhesive, 4 of 30 dogs died (within 3-4 months of surgery) and 3 of 30 showed stenosis. The major causes of death were leakage of the anastomosis with peritonitis and intestinal obstruction due to stenosis or adhesions. No mortality or stenosis occurred when conventional end-to-end suture anastomosis was done with (7 dogs) or without (7 dogs) adhesive reinforcement of the sutures. Localized abscesses developed at 14 months in 2 of 10 animals with serosal patch adhesive closure and stenosis was observed in 1 of 7 dogs in which inverting suture closure was used. There were no complications when serosal patch with conventional suture closure was used, with (10 dogs) or without (7 dogs) adhesive reinforcement. No deaths occurred among any of the closure groups, regardless of surgical technique. Segments in which the suture line was reinforced with adhesive after anastomosis or patch closure were able to hold about 1.5 times as much isotonic saline injected into the segment as nonreinforced segments. Reinforcement of the suture line with aerosol tissue adhesive did not increase mortality or surgical complications. The primary use of tissue adhesive in intestinal surgery is not recommended as a substitute for conventional suture techniques.

1723 FECAL BLOOD LOSS FOLLOWING ASPIRIN AND COATED ASPIRIN MICROSPHERULE ADMINISTRATION. *(E.)* Frenkel, E. P. (VA Hosp., Dallas, Tex.), M. S. McCall, C. C. Douglass and S. Eisenberg. *J Clin Pharmacol* 8(6):347-351, 1968.

The fecal excretion of ^{51}Cr-labeled erythrocytes was assayed in 12 healthy male subjects (26-71 yr old) given 20 grains of plain aspirin t.i.d. for 5 consecutive days and the same dosage of GRF 723, an enteric-coated microspherule preparation, for another 5 consecutive days (order of presentation randomly alternated), with an additional 5-day control interval between the testing periods. Due to individual variations in transit time, there were lags between bleeding and detection of blood in the feces. In all subjects, bleeding first appeared 1-4 days after beginning the salicylate therapy, and cessation of increased bleeding occurred 3-6 days following the final drug dose; in every case the fecal blood loss returned to control levels before the effects of the 2nd course of aspirin appeared. The enteric-coated aspirin resulted in significantly lower total blood loss (7.77 ± 4.93 ml) than occurred with regular aspirin (18.54 ± 8.38 ml). Although considerable daily variation occurred, the mean blood loss per treatment day was 3.71 ml with plain aspirin and 1.55 ml with GRF 723. This 57.6% reduction in bleeding appears to support the view that the local corrosive effect of aspirin on the gastrointestinal mucosa may be minimized by use of a microspherule enteric-coated preparation.

1724 MORPHOLOGIC EFFECTS OF GRADED CELIAC ARTERY ISCHEMIA. *(E.)* Anderson, M. C. (Northwestern U. Med. Sch., Chicago, Ill.), W. R. Schiller, M. Suwa and R. E. Geurkink. *Bull Soc Int Chir* 27(5):468-477, 1968.

Partial or total occlusion of the root of the celiac artery was achieved by ligation with a silk ligature or by application of a Goldblatt clamp in 69 dogs with the celiac circulation completely isolated from all collaterals. Control animals tolerated the isolation procedure with no apparent pathologic changes in any of the end organs. Complete occlusion of the isolated celiac artery resulted in massive hemorrhagic infarction of the stomach, duodenum, liver and pancreas, and death occurred in less than 24 hr (5 of 5 animals). When a pressure gradient of 25% was created across the root of the celiac artery, 9 of 12 dogs survived for at least 2 days, and 5 dogs developed ulceration in the stomach, usually involving the greater curvature. With 50% occlusion 6 of 33 animals died early in the postoperative period; mild pericentral congestion in the liver and mild interlobular edema in the pancreas were found in many animals. Gastric ulcers were less frequent, although early superficial ulcers may have healed through revascularization via adhesions. With 75% occlusion early mortality was high, hepatic sinusoidal and pericentral congestion were more pronounced and 17 of 39 dogs showed signs of gastric ulceration or chronic gastritis. The duodenum and pancreas appeared to be quite resistant to partial celiac occlusion. With high gradients, complete occlusion of the artery often occurred, probably due both to the trauma of clamp application and to the degree of stenosis. The frequency of gastric pathology supports the concept that gastric ulcer may be related to celiac artery ischemia, while the alterations in intrahepatic circulation could have resulted either from hepatic arterial insufficiency or from some substance elaborated in other organs supplied by the celiac artery and delivered to the liver by the portal venous circulation.

1725 THE ASSOCIATION OF HYPERGLYCAEMIA AND TUMOURS OF THE ALIMENTARY TRACT.

(E.) Morton, H. S., H. A. L. Michalek and A. Sledge. *Bull Soc Int Chir* 27(5):442-448, 1968.

Blood sugar levels were determined in 837 cases of gastrointestinal malignancy and compared with those in over 600 controls. Patients with sarcomatous growths of muscular origin in the proximal gastrointestinal tract showed a very small proportion of normal values (70-100 mg% by autoanalyzer or 80-120 mg% by Hagedorn-Jensen and Folin-Wu); 24 of 71 lesions affecting the stomach were associated with "impaired" blood sugar values (100-130 mg% or 120-150 mg% by the 2 methods, resp.) and 21 had values in the diabetic range (above 130 mg% or above 150 mg% by the 2 methods, resp.); the values associated with 4 of 5 colonic growths and 2 of 2 rectal growths were almost normal. In contrast, neurogenic sarcomatous growths of the stomach were associated with "impaired" or diabetic levels in 8 and 3 of 13 cases, resp.; in growths of the small and large intestine, levels were diabetic in 6 of 9 and 2 of 2 patients, resp. Lymphomata of the stomach, small intestine, colon or rectum were associated with "impaired" values in 15% and diabetic values in 11% of the cases; the three varieties (reticulum cell sarcoma, lymphosarcoma and Hodgkin's disease) showed consistent results, blood sugar levels being normal in 85, 63 and 71%, resp. The proportion of cases with abnormal blood sugar levels was even more marked in cancer of the pancreas (49 "impaired", 28 diabetic among 93 cases) and of the liver (12 "impaired", 6 diabetic among 27 cases). This incidence was independent of the presence of jaundice. The glucose tolerance curve after surgery of the stomach, colon or rectum rose higher and descended more precipitously than the normal or preoperative tolerance curves. Insulin treatment in late cases of carcinoma improved appetite, reduced the amount of sedation required, caused a sense of well-being and seemed to stimulate intestinal movement. The detection of diabetes in association with vague abdominal symptoms should signal the possibility of a small intestinal growth, particularly before it reaches an inoperable size.

1726 GASTRO-INTESTINAL FUNCTION AFTER ABDOMINAL COBALT IRRADIATION.

(E.) Ratzkowski, E. (Hadassah U. Hosp., Jerusalem, Israel) and A. Hochman. *Acta Radiol [Ther] (Stockholm)* 7(6):417-432, 1968.

After therapeutic telecobalt irradiation was given to a part or whole of the abdomen (2000-4000 rad) of 75 patients with generalized abdominal malignancy, the functional condition of the gastrointestinal mucosa was studied by B_{12} absorption, triolein absorption, ^{131}I-polyvinylpyrrolidone loss, and gastric acid secretion tests. The B_{12} absorption was impaired in 1/3 of the patients and was inversely proportional to the dose. The number of patients affected began to diminish 1 month after cessation of treatment. The fecal triolein excretion was high in 25% of patients, the peak excretion being in the dose range 600-1000 rad. The greatest percentage of abnormal tests and highest mean abnormal fecal excretion were noted after irradiation of the whole abdominal cavity. It was noted that blood radioactivity was not a sensitive indicator of fat malabsorption. The polyvinylpyrrolidone test revealed almost no macromolecule loss through the gastrointestinal mucosa in the therapeutic dose-ranges. Gastric acid secretion was diminished in 2/3 of the patients after more than 800 rad, but restoration to normal acid levels occurred in most of them.

1727 NECROTIZING ENTEROCOLITIS IN PREMATURE INFANTS.

(E.) Dénes, J. (Apáthy Child. Hosp., Budapest, Hungary), K. Gergely, J. Léb and A. Mohácsi. *Acta Paediat Acad Sci Hung* 9(3/4):237-244, 1968.

Six cases (4 females and 2 males) of necrotizing enterocolitis were observed in small premature infants within the 1st 6 weeks of life. In 3 cases early rupture of the amniotic membrane, and in 3 other cases, an exchange transfusion (enteritis preceded by omphalitis in 2 of the 3) were the probable source of infection. All patients had frequent bloody stools and abdominal tenderness; involuntary muscular rigidity was noted in 2 cases. Suture of the intestinal perforation and abdominal drainage was performed in 4 cases, exploration and drainage of a pericecal abscess was performed in 1 case, and cecostomy was performed in 1 case. Organisms isolated from feces, peritoneal fluid, or cerebrospinal fluid included *E. coli, Klebsiella, Ps. aeruginosa, Proteus vulgaris* and *Enterococcus.* Postoperative complications included pneumonia in almost every case, meningitis in 2, and a fecal fistula in 2 cases. The surgical intervention with massive local and parenteral antibiotics was followed by regression of symptoms and restoration of peristalsis in 3 cases; however, intervening meningitis or some other cause led to a fatal outcome in 5 of the 6 cases. Early diagnosis of this condition is stressed with the earliest possible surgical intervention.

1728 **INVASION OF THE INTESTINAL WALL AND HYPERSENSITIVITY TO *ENTAMOEBA HISTOLYTICA*.** *(Sp.)* Beltran H., F. (Med. Fac., Natl. Independent U. Mexico, Ciudad Universitaria), S. Monterrosa M., H. Barquero and F. Biagi F. *Prensa Med Mex* 33(11/12):416-420, 1968.

In 5 groups of 15 guinea pigs each, the lesions produced in the large intestine and liver by 1 or 2 intracecal injections of 200,000 trophocytes of *Entamoeba histolytica* (strain HGM_2) were compared with those produced by the same dose into the cubital vein followed, 12 days later, by an intracecal injection. The presence of antibodies to *Ent. histolytica* was demonstrated by the serum immobilization test in the last group of animals. Ulcers, hemorrhagic lesions, and mucosal erosion were found in the large intestines of 33% of the animals receiving 1 intracecal injection and in 43% of the sensitized animals. Ulcers were found in 8% of the guinea pigs receiving 1 intracecal injection, in 33% of those receiving 2 intracecal injections, and in 45% of those given both i.v. and intracecal injections. In sensitized animals these lesions were more severe, producing intestinal perforations and occasional liver abscesses. Hepatic lesions were present in 55% of the sensitized animals, in 36% of those receiving 2 intracecal injections, and in 0% of those receiving 1 intracecal injection. These results show that under the experimental conditions employed prior contact with *Ent. histolytica* does not confer immunity but favors the production of lesions in a subsequent infection.

1729 **ACUTE FATAL ENTEROCOLITIS: CLINICAL AND AUTOPSY STUDIES.** *(Ger.)* Kapp, F. (Inst. Path., U. Basel, Switzerland). *Praxis* 58(1):7-16, 1969.

Acute enterocolitis was found to be a direct or contributing cause of death in 57 of 11,923 patients autopsied in Basel during a 5-yr period. No changes in its incidence were observed between 1959 and 1964. Most cases of enterocolitis occurred in patients between 51 and 80 yr, and more males than females were affected (37 males and 20 females). In 25 cases enterocolitis developed after surgery. These operations included 15 abdominal procedures, 10 of which were performed directly on the gastrointestinal tract, and 4 thoracic procedures. Shock was present in 24 cases, but it could not be determined whether enterocolitis preceded or followed the onset of shock. Large doses of antibiotics were implicated in 15 cases. Enterocolitis also developed in 2 patients after cytostatic therapy with SPI and SPG and in 2 patients receiving endoxan with antibiotics. Other clinical findings included 5 cases of coprostasis, 3 intestinal infections, 20 patients with staphylococci in the intestinal flora, and 4 cases of uremia. There was a great variety of gross anatomical and histological changes. They included pseudomembranes, necrosis, inflammatory infiltrates, vascular dilatation, edema, thromboses, and hemorrhages. Histological studies of pseudomembranes showed that they consist mainly of mucus but also contain threads of fibrin, necrotic epithelial cells, granulocytes and leukocytes. In many cases only the upper parts of the mucosal folds were inflamed. There was no correlation between autopsy findings and the cause of enterocolitis. Disturbances in the intestinal flora, circulatory disorders, and cell damage are considered to be important etiological factors.

1730 **LESIONS ASSOCIATED WITH GASTRODUODENAL HAEMORRHAGE, IN RELATION TO ASPIRIN INTAKE.** *(E.)* Valman, H. B. (West Middlesex Hosp. Isleworth, England), D. J. Parry and N. F. Coghill. *Brit Med J* 4(5632):661-663, 1968.

The incidence of aspirin ingestion during the week preceding overt gastroduodenal bleeding was recorded in 582 patients, including 280 with chronic peptic ulcers, 25 with an acute gastric ulcer or erosion, 115 with other diagnoses and 162 in whom no lesion could be found. A positive aspirin history was found in 80% of patients with acute gastric lesions, 63% of those in whom no lesion was found, 52% of those with a chronic duodenal ulcer, and 49% of patients with a chronic gastric ulcer. In a control series of 542 consecutive patients without overt bleeding admitted to the same wards during part of the time of this investigation, the aspirin incidence was 32%. The difference in aspirin habits between these 2 series confirms that aspirin is a factor in precipitating overt hemorrhage in acute and chronic peptic ulcers, and that it is an important cause of bleeding from the stomach or duodenum, or both, in the absence of a chronic peptic ulcer.

1731 **RESULTS OF A STUDY OF ENTEROBACTERIACEAE IN THE INTESTINAL FLORA DURING AMEBIASIS.** *(Fr.)* Albert, J. P. (Muraz Ctr., Bobo Dioulasso, Upper Volta), J. H. Ricossé and J. J. Picq. *Med Trop (Marseille* 28(6):786-794, 1968.

Stool cultures from 32 noninfected controls revealed that 80-100% of the intestinal flora were *Escherichia coli.* In contrast, 10% of more of the colonies isolated from the stools of 106 of 150 patients with amebiasis consisted of *Klebsiella pneumoni* or other Enterobacteriaceae which gave a positive Voges-Proskauer test. In 44 cases these bacteria constituted less than 10% of the intestinal flora, but these patients had a higher percentage of *Proteus* than the controls. Enterobacteriaceae giving a positive Voges-Proskauer test decreased or disappeared after metronidazole therapy. It is suggested that the presence of *Entamoeba histolytica* might favor the growth of Voges-Proskau positive Enterobacteriaceae which, in turn, favor aggression of the parasite or sensitization of the mucosa. This would account for the effectiveness of amebicides and antibiotics which prevent the symbiotic activity between *Entamoeba histolytica* and these Enterobacteriaceae.

1732 **ATTEMPT TO TRANSMIT AMYLOIDOSIS IN HOMOZYGOUS MICE BY PARABIOSIS.** *(Ger.)* Linke, R. P. (Inst. Path., U. Tübingen, Germany) and H. Kuni. *Virchow Arch Abt A Path Anat* 346(1):89-102, 1969.

Homozygous mice of the same sex and weight were joined by the method of Bunster and Meyer in which blood vessels under the panniculus carnosus are retained intact. The right partner in each of the 73 pairs evaluated was given 6 doses of 0.3 ml 5% casein s.c., 5 injections of casein and 1 of casein and Freund adjuvant, or osteomyelitis by fracture of the right femur and coating the exposed bone marrow with fecal material. The treated partner developed amyloidosis in 62 of these 67 pairs (93%); only 9 (13%) of the untreated partners did so. This difference is highly significant. Casein treatment was significantly less effective in inducing amyloidosis than casein and Freund's adjuvant or experimental osteomyelitis. Osteomyelitis affected the liver more frequently than casein and Freund's adjuvant, but this difference was not significant. There was no relation between the incidence of amyloidosis in the untreated partner and the intensity of treatment. Amyloidosis occurred significantly more often in the untreated partner of pairs which developed abscesses in the parabiotic junction. Amyloidosis was always less severe in the untreated partner. The incidence of amyloidosis was highest and the extent of amyloid deposits was greatest in the spleen followed by the liver and kidneys. Liver amyloid deposits were seen only if the spleen was also affected and renal amyloid deposits, which were observed in only 1 case, were accompanied by spleen and liver deposits. The extent of amyloid deposits was related to mesenchymal activation which, in the liver, consisted of endothelial proliferations and proliferations of the vascular adventitia in interlobular veins. Mesenchymal activation was also observed in untreated partners which did not develop amyloidosis. The agent causing amyloidosis was calculated to have a half-life of less than 22.8 min. This rules out all substances with longer half-lives, particularly serum proteins.

1733 **TREATMENT OF MASSIVE GASTROINTESTINAL BLEEDING.** *(Ger.)* Herzog, K. H. (Surg. Clin., U. Rostock, Germany). *Z Ges Inn Med* 23(23):755-759, 1968.

Of 294 patients treated for upper gastrointestinal bleeding in a 6-yr period, 186 had peptic ulcers, 46 had esophageal varices, 22 had stomach carcinomas, 13 had erosive gastritis, 8 had miscellaneous conditions (hiatus hernia, diverticula, gastric polyps), and 20 were undiagnosed. A total of 62 (21%) died. Conservative treatment was employed in 117 cases with 26 fatalities, and surgical treatment was employed in 178 cases with 36 fatalities. Severe bleeding and shock were present in 73 of these 295 patients. Surgery was performed on all patients in shock and on those who did not respond to conservative treatment in 48 hr. When the source of bleeding could not be ascertained, 2/3 of the stomach was removed empirically but bleeding persisted in 90%. Stepwise resections were performed for ulcers located high in the stomach. Recurrences of bleeding were treated either by removal of an overlooked source of bleeding or by selective gastric vagotomy if the cause of bleeding could not be diagnosed.

1734 **SALMONELLA AND SHIGELLA INFECTIONS IN CHILDREN: A REPORT OF 73 CASES.** *(Fr.)* Lelong, M. (Hosp. Ctr., Lens, France), J. Polaert and P. Deroubaix. *Lille Med* 14(1):28-32, 1969.

The 73 children treated for shigellosis and salmonellosis during the period 1961-68 included 15 (8 under 1 yr old) with shigellosis (14 sporadic cases of *Sh. sonnei* infection and 1 of *Sh. flexneri*), 37 infected with *Salmonella typhi murium* (29 under 1 yr old), including 28 cases during an epidemic of food poisoning in 1964-65, 8 infected with *S. para* B, 3 with typhoid fever, and 10 (8 under 1 yr old) with less common types of salmonellosis (*S. Panama, S. Newport, S. enteritidis, S. meleagridis, S. Lindenburg, S. Brandenburg)*. Hemorrhagic gastroenteritis was noted in 8 of these 73 children (2 with shigellosis, 6 with salmonellosis) and positive blood cultures were obtained in 6 (2 each with *S. typhi murium, S. para* B and typhoid fever). Treatment involved antibiotics (chloramphenicol in the salmonelloses; colimycin, polymyxin, neomycin and/or a furan derivative in the shigelloses), often accompanied by glucose or saline infusions. Symptoms such as fever, dehydration and gastroenteritis cleared up within 7-10 days in most cases, although some cases of *S. typhi murium* infection had a prolonged course (none died) and 2 patients (1 with typhoid fever and 1 with *S. para* B) required 2 courses. In view of the frequent cross-immunity between the various types of *Salmonella,* the importance of blood- and stool-cultures in the proper diagnosis of the salmonelloses is emphasized.

1735 **CARCINOID TUMORS OF THE GASTROINTESTINAL TRACT.** *(E.)* Ayulo, J. A. (California Coll. Med., Los Angeles). *Amer J Gastroent* 51(2):138-144, 1969.

Only 53 cases of gastrointestinal carcinoid tumors were detected in a group of 4 California hospitals during the period 1953-67. Rectal carcinoids were the most frequent, comprising 24 of the 53 (45.2%); these were more common in females than in males (2:1), and were found in patients between 30 and 60 yr old. The racial division was 19 Caucasian and 5 Negro, and 23 of the 24 were within range of the sigmoidoscope. The sites of the other carcinoid tumors in this series were: appendix, 20 (37.7%); ileum, 5 (9.4%); cecum, 2 (3.7%); duodenum 1 (1.8%); and Meckel's diverticulum, 1 (1.8%). The appendiceal carcinoids were incidental findings at surgery, usually associated with a ruptured appendix, uterine fibroma, or carcinoma. Some of the ileal and cecal carcinoids presented the carcinoid syndrome associated with a hypertensive condition, corrected after removal of the tumor at surgery. The duodenal and Meckel's diverticulum carcinoids were asymptomatic and incidental findings at surgery. The carcinoid syndrome became manifest only when the size of the tumor was large enough, metastases were present, and the liver was involved.

1736 **CARCINOID TUMORS OF THE GASTROINTESTINAL TRACT.** *(E.)* Baeza, M. G. (Baylor U. Med. Ctr., Dallas, Texas). *Dis Colon Rectum* 12(2):147-152, 1969.

Among 54 patients with carcinoid tumors of the gastrointestinal tract, there were 15 males and 39 females, 7-77 yr of age with the greatest incidence in the 5th decade. The locations of the tumors were: appendix, 32; small intestine, 9; ileocecal area, 3; colon, 4; rectum, 4; stomach, 1; and duodenum, 1; in 1 patient with a malignant carcinoid the site of orgin was not established. In only 3 cases was the correct diagnosis made before operation. Carcinoids were the cause of symptoms in 15 (30%) patients; the remaining 39 (70%) were asymptomatic, with the carcinoid tumor being an incidental finding at surgery. The carcinoid syndrome occurred only in the presence of widespread metastasis, involvement of the liver and circulating serotonin. Only 11 of the 54 cases showed a malignant course, but this included all 3 ileocecal tumors, 3 of 5 ileal tumors, and 2 of 4 colonic tumors. All but one of the appendiceal tumors were benign. It is felt that an aggressive attempt to remove the tumor and all metastases should be undertaken. Carcinoid should be suspected when a middle-aged or elderly patient complains of abdominal pain and diarrhea and a mass is discovered in the right lower portion of the abdomen; determination of urinary 5-hydroxyindoleacetic acid may help to establish a correct diagnosis.

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01448*
AGE FACTORS IN ULCERS
01405
ALBUMIN
SEE LIVER
SEE PLASMA PROTEINS
ALCOHOL
SEE ALSO FATTY LIVER
SEE ALSO PANCREATITIS
01786
ALCOHOL EFFECTS ON LIVER
01121* 01164 01618 01648* 01700 01768
ALCOHOL EFFECTS ON PANCREAS
01528
ALCOHOL IN CIRRHOSIS
01562 01605 01665 01674 01721*
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01112* 01517* 01528
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01543*
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01008* 01017* 01119* 01205* 01209* 01247 01313* 01558
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01654*
ALLERGIES
SEE IMMUNOLOGY
AMEBIASIS DIAGNOSIS
01230 01554* 01770
AMEBIASIS EFFECTS ON LIVER
01230 01554* 01601 01728* 01761
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01264 01761 01770
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01770
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01230 01728*
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01230 01554* 01601 01622 01731* 01761 01763 01770
01801
AMINO ACID ABSORPTION
SEE ALSO PROTEIN ABSORPTION
01038* 01050* 01052 01062 01351*
AMINO ACID METABOLISM
01111* 01133* 01144* 01150* 01159 01169 01589 01647*
01741 01803
AMINO ACID METABOLISM,LIVER
01128* 01134* 01158
AMINOPEPTIDASE,LEUCINE
01205*
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01588
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01150* 01171 01547* 01550* 01590 01654*
AMPULLA OF VATER
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01025* 01676* 01679* 01697 01710 01718
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01114 01517*
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01111* 01113* 01143*
AMYLOIDOSIS
01602 01732* 01762
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01113*
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01371 01372 01373 01374 01386 01483 01511 01515
01586 01673 01676* 01712 01718 01722* 01807
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01251
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SEE ALSO FOLIC ACID
SEE ALSO LIVER DISEASES
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01288 01755 01764
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01318*
ANEMIA,HEMOLYTIC
01564 01618
ANEMIA,IRON-DEFICIENCY
01047* 01048* 01053 01327 01435
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01054
ANESTHESIA
01239 01488 01546*
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01269
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01165
ANEURYSMS
01301 01485
ANGINA,ABDOMEN
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01207* 01487 01777
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01268 01668 01777
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01560
ANGIOGRAPHY,GASTROINTESTINAL
01236 01260 01446*
ANGIOGRAPHY,LARGE INTESTINE
01263
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01224 01248 01253 01781 01805
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01465 01568
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01798
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01470
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01544* 01545* 01553*
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01256 01261 01286 01295 01296 01322 01341 01358
01362 01365 01436 01456 01470 01475 01511 01544*
01545* 01560 01777 01778 01798 01811
ANOMALIES,DUODENUM
01260 01365
ANOMALIES,ESOPHAGUS
01261 01279* 01286 01295 01296
ANOMALIES,GALLBLADDER
01512 01686
ANOMALIES,GASTROINTESTINAL
01341 01798
ANOMALIES,LARGE INTESTINE
01456 01475
ANOMALIES,LIVER
01545*
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01505* 01511 01512
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01470 01475 01481
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01322 01358 01362 01363 01385 01512
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01322 01512
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01489
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01464 01470 01489
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01515
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01409
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01393* 01433 01454* 01474 01523 01546* 01607* 01634
01654* 01720* 01729* 01734* 01759 01765 01783 01784
01785 01797 01812
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01167 01562
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01068* 01075* 01103
ANTICOAGULANTS
01721*
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01049* 01050* 01121* 01158 01330 01542* 01578 01616
01651* 01807
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01091* 01092* 01093* 01094*
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01091* 01254 01294 01396* 01398* 01419
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01072* 01100 01117* 01193* 01198* 01309*
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01470
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01214* 01477
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01477
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01460 01464

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01477
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01460 01462
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01488
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01214*
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01214* 01477 01489
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01460 01477
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01252 01287 01349* 01446* 01458 01466 01473 01474
01479 01746
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01779
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01446* 01468 01479
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01447* 01474
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01196* 01518 01540* 01575 01652* 01753
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01215* 01588 01648* 01650* 01656 01660 01661 01662
01663 01665 01669
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01371 01372 01665 01712
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01295 01296
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01416
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01068*
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01013* 01024* 01067* 01126* 01283 01314* 01530

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01454* 01607* 01731*
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01655* 01663
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01463
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01463
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01463 01465
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01515
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01463 01465
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01199* 01484
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01346
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01087* 01109* 01411
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01055
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01439
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01042* 01055 01059 01125* 01129* 01143* 01392* 01439
01700 01711 01712 01737
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01059 01129*
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01042* 01065 01117* 01126* 01129* 01714 01719
BILE DUCT
SEE BILIARY TRACT
BILE DUCT,COMMON
SEE ALSO BILIARY TRACT
01025* 01110* 01223 01232 01533* 01570 01585 01596
01676* 01679* 01685 01687 01688 01689 01690 01691
01692 01693 01694 01695 01698 01699 01702 01712
01717
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01126* 01146*
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01065
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01711
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01620
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01113* 01572 01700
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01168 01203*
BILE PIGMENTS,SERUM
01558
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01006* 01014* 01113* 01117* 01126* 01129* 01143* 01147*
01266 01575 01577
BILE SECRETION,DRUG EFFECTS ON
01129*
BILE,DIGESTIVE ACTION OF
01055 01059
BILIARY CIRRHOSIS
01553* 01561 01562 01645 01657 01672
BILIARY DISEASE DIAGNOSIS
01207* 01208* 01209* 01213* 01223 01227 01232 01237
01239 01243 01247 01253 01266 01550* 01560 01567
01570 01657 01691 01692 01702 01715 01717
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01683
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01604 01675* 01708 01709
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01232 01560 01657 01672 01681*
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01232 01515 01560 01569 01600 01683 01684 01698
01703
BILIARY ILEUS
01710
BILIARY TRACT
SEE ALSO CHOLECYSTITIS
SEE ALSO CHOLELITHIASIS
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01025*
BILIARY TRACT ANGIOGRAPHY
01560
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01544* 01545* 01553*
BILIARY TRACT CANCER
01569 01699
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01223
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01478 01696 01708 01710 01711
BILIARY TRACT IMMUNOLOGY
01657
BILIARY TRACT IN CHILDREN
01544* 01545*
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01556
BILIARY TRACT MORPHOLOGY
01025* 01717
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01071* 01239 01577
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01232 01560 01697
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01678* 01699
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01205* 01208* 01209* 01213* 01227 01232 01243 01533*
01536* 01539* 01560 01570 01585 01595 01596 01599
01706 01713 01718
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01533* 01560 01640 01710
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01706
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01207* 01212* 01213* 01227 01237 01239 01243 01247
01253 01266 01560 01676* 01677* 01685 01687 01689
01692
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01392* 01675* 01702
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01205* 01239 01521 01532 01533* 01544* 01545* 01553*
01560 01561 01675* 01676* 01677* 01678* 01679* 01681*
01687 01688 01689 01690 01691 01692 01693 01696
01697 01698 01699 01702 01703 01706 01707 01709
01712 01716 01718
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01113* 01239
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01126*
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01006* 01113* 01143* 01148* 01168 01203* 01558 01572
01585 01700
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01206*

BIOCHEMICAL DIAGNOSIS OF HEPATITIS
01206*
BIOCHEMICAL DIAGNOSIS OF LIVER DISEASES
01128* 01205* 01616
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01229 01241
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01494*
BIOCHEMISTRY,GASTROINTESTINAL
01027 01079 01184 01745
BIOCHEMISTRY,LARGE INTESTINE
01017* 01181*
BIOCHEMISTRY,LIVER
01014* 01017* 01019* 01019* 01026* 01030 01119* 01120*
01121* 01123* 01124* 01125* 01127* 01128* 01130* 01131*
01132* 01134* 01136* 01137* 01138* 01139* 01140* 01141*
01145* 01146* 01148* 01149* 01150* 01151 01152 01153
01154 01156 01157 01159 01160 01161 01163 01164
01165 01170 01173 01175 01205* 01541* 01555 01625*
01635 01639 01655*
BIOCHEMISTRY,PANCREAS
01111* 01112* 01115 01116 01188 01229 01526 01581
BIOCHEMISTRY,RECTUM
01452*
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01005* 01008* 01016* 01020* 01023* 01040* 01043* 01044*
01050* 01056 01062 01176* 01179* 01180* 01182* 01183*
01442 01711 01712
BIOCHEMISTRY,STOMACH
01046* 01089* 01105
BIOPSY IN CANCER DIAGNOSIS
01285 01490
BIOPSY,ESOPHAGUS
01285
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01222 01770
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01265 01758
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01195* 01196* 01206* 01208* 01230 01242 01384 01534*
01536* 01551* 01556 01574 01606* 01674 01781
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01183* 01197* 01442 01758 01762
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01007*
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01234 01293
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01199* 01216* 01288 01385 01485 01723* 01782 01813
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01260 01782
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01199* 01256 01260 01280* 01288 01306* 01307* 01332
01348 01350* 01369 01385 01407 01413 01485 01487
01488 01505* 01548* 01557 01723* 01730* 01733* 01740
01741 01762 01763 01781 01782 01786 01804 01810
01813
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01297 01407 01413 01627* 01730* 01782
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01289 01291 01307* 01485 01488 01673 01733* 01782
01813
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01319*
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01291 01369 01385 01396* 01421 01733*
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01037* 01439
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01242 01413 01546* 01577 01586 01621 01740
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01289 01649*
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01304*
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01313*
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01561
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01257 01311* 01364 01503* 01509 01735* 01736*
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01285 01490
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01285 01333 01490
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01195* 01199* 01262 01263 01285 01333 01461 01490
01780
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01228 01304* 01312* 01387* 01490
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01583 01780
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01167 01285 01302 01320* 01329 01332 01335 01445*
01448* 01451* 01480 01483 01484 01490 01503* 01566
01697 01767
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01320* 01445* 01448* 01480 01484 01490 01503* 01804
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01302 01320* 01329 01330 01332 01364 01451* 01454*
01484 01566 01678* 01721* 01729* 01735* 01736* 01800
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01726*
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01448*
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01278* 01279* 01282 01285 01292 01293 01300 01301
01302 01780 01800
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01677* 01678* 01703
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01224 01780 01800
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01445* 01449* 01451* 01457 01461 01480 01484 01486
01490 01497* 01725* 01780
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01196* 01217* 01218* 01230 01266 01551* 01557 01580
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01195* 01224 01282 01369 01384 01448* 01480 01503*
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01209* 01229 01257 01503* 01505* 01509 01514 01676*
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01445* 01448* 01452* 01480 01490 01497*
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01364 01380 01725* 01780
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01007* 01096* 01194* 01228 01282 01304* 01311* 01312*
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01036* 01040* 01052 01060 01215* 01351* 01353* 01433
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01382 01735* 01736*
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01228 01312* 01461 01678* 01725* 01758
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01207* 01218* 01223 01243 01283 01289 01297 01314*
01319* 01326 01348 01357* 01407 01412 01509 01524
01531 01545* 01546* 01549* 01576 01602 01606* 01638
01659 01662 01665 01666 01671 01713 01721* 01729*
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01430* 01435 01441 01443 01770
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SEE ALSO TOXIC EFFECTS ON LIVER
SEE ALSO TOXIC EFFECTS ON PANCREAS
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01121* 01606* 01608 01613 01615
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01302 01330 01332 01454* 01490 01566 01609 01807
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01753 01778 01798
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01779 01788 01811
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01811 01813
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01640 01653*
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01433 01435 01441 01743 01744 01757
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01803
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01727*
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01290 01295 01296
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01639
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01009* 01548* 01576 01583
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01433 01435 01441 01548* 01754 01803
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01099 01310*
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01626* 01639 01640 01641 01778
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01207* 01212* 01213* 01227 01239 01243 01247 01253
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01715 01717
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01533*
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01366 01461 01467 01471 01472 01473 01476 01486
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01155 01156 01157 01159 01161 01162 01163 01165
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01550* 01552* 01554* 01558 01567 01577 01578 01582
01585 01587 01591 01595 01600 01603 01605 01614
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01648*
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01005* 01007* 01012* 01020* 01022* 01023* 01024* 01028
01039* 01043* 01058 01060 01062 01063 01079 01177*
01179* 01180* 01182* 01183* 01328 01350* 01353* 01362
01370 01375 01428* 01429* 01438 01440 01442 01468
01738
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01007* 01010* 01045* 01046* 01084* 01085* 01086* 01089*
01095* 01100 01106 01201* 01270 01304* 01305* 01306*
01307* 01309* 01315* 01316* 01325 01327 01333 01342
01389* 01390* 01405 01416 01686 01760
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01105 01348 01397*
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01233 01753
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01095* 01105 01757
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01086*
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01068* 01075* 01482
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01075*

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01454*
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01423* 01454* 01727*
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01463 01465
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01515
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01199* 01484
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01346
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01232 01560 01697
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01384
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01300
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01478 01735* 01736*
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01137* 01224 01560 01568 01599
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01678* 01699
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01279* 01292
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01725* 01800
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01580 01583 01605
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01497*
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01199* 01360 01364 01380 01384 01758
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01312* 01321* 01323 01324 01332 01402
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01742 01752 01766 01775
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01013* 01024* 01067* 01126* 01283 01314* 01530
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01150* 01379 01406 01495* 01496* 01519 01547* 01564
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01450*
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01144*
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01746
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01356*
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01536* 01539* 01560 01570 01585 01595 01596 01599
01706 01713 01718
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01333
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01756 01770 01789 01790 01811
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01240 01366 01367 01368 01445* 01471 01480 01486
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01072* 01310* 01322 01326 01341 01365 01424 01512
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01240 01258 01309* 01322 01347 01350* 01355* 01358
01362 01363 01366 01367 01368 01378 01425 01468
01511 01532 01707 01751 01763 01769
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01209* 01229 01257 01503* 01505* 01509 01514 01676*
01677* 01725* 01774 01780 01800
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01518 01522 01530
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01512
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01752 01772
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01506* 01508 01512 01532 01770
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01229 01241
PANCREAS DUCTS
01528 01718
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01581
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01046* 01059 01111* 01114 01115 01116 01188 01220
01229 01438 01469 01516* 01775
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01511
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01178*
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01351* 01808
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01090* 01411 01517*
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01759
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01080* 01091*
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01088* 01103 01108 01316* 01760
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01080* 01086* 01088* 01327
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01413 01414 01419 01478 01730* 01733* 01782
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01308* 01400 01412 01414 01420
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01069* 01255 01308* 01317* 01339 01340 01388* 01388*
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01401 01402 01406 01408 01409 01412 01414 01418
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01287 01340 01505* 01512
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01322 01415 01778 01811
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01297 01407 01413 01627* 01730* 01782
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01090* 01321* 01394* 01411
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01057 01074* 01211* 01261 01381 01383
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01196*
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01161 01655*
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01008* 01017* 01119* 01205* 01209* 01247 01313* 01558
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01120* 01146* 01153 01338 01427* 01429* 01432 01494*
01535* 01550* 01552* 01564 01606* 01615 01619 01644
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01388* 01388* 01415 01418 01495* 01496* 01564
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SEE ALSO TOXIC EFFECTS ON LARGE INTESTINE
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SEE ALSO TOXIC EFFECTS ON PANCREAS
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01195* 01199* 01262 01263 01285 01333 01461 01490
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01536*
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01214*
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01207* 01212* 01213* 01227 01237 01239 01243 01247
01253 01266 01560 01676* 01677* 01685 01687 01689
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01343 01412 01422 01446* 01756
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01257
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01384
RUPTURE,DUODENUM
01347
RUPTURE,LIVER
01557

SALIVARY GLAND SECRETION
01078* 01114
SALIVARY GLANDS
01302
SALIVARY GLANDS,NERVOUS CONTROL OF
01078*
SALMONELLCSIS
SEE ALSO PARATYPHOID FEVER
SEE ALSO TYPHOID FEVER
01749 01757
SALMONELLCSIS EPIDEMIOLOGY
01739 01759
SALMONELLOSIS IMMUNOLOGY
01759
SALMONELLCSIS IN CHILDREN
01734* 01778
SALMONELLOSIS PROPHYLAXIS
01759
SALMONELLCSIS TREATMENT
01759
SARCOMA
01380 01382 01609 01725* 01758
SCANNING,SCINTILLATION
01077 01162 01195* 01230 01236 01257 01374 01536*
01554* 01570 01595
SCHISTOSOMIASIS DIAGNOSIS
01219*
SCHISTOSOMIASIS EPIDEMIOLOGY
01264
SCHISTOSOMIASIS IMMUNOLOGY
01219*
SCHISTOSOMIASIS PATHOLOGY
01351*
SCHISTOSOMIASIS TREATMENT
01802
SCINTILLATION SCANNING
01077 01162 01195* 01230 01236 01257 01374 01536*
01554* 01570 01595
SECRETIN
01011* 01065 01109* 01110* 01115 01129* 01187 01411
01528
SECRETION DISORDERS,STOMACH
01090* 01216* 01327 01334 01336 01421 01742
SECRETION IN DISEASE,STOMACH
01410
SECRETION STUDY TECHNIQUES
01096* 01109* 01110*
SECRETION STUDY TECHNIQUES,STOMACH
01046* 01082* 01084* 01094* 01099 01104 01107 01108
01202* 01249 01254 01388* 01388*
SECRETION,BILE
01006* 01014* 01113* 01117* 01126* 01129* 01143* 01147*
01266 01575 01577
SECRETION,DRUG EFFECTS ON BILE
01129*
SECRETION,DRUG EFFECTS ON STOMACH
01088* 01091* 01092* 01093* 01094* C1306* 01401 01405
SECRETION,DUODENUM
01033
SECRETION,GALLBLADDER
01113*
SECRETION,GASTROINTESTINAL
01079 01187 01222
SECRETION,HORMONAL CONTROL OF STOMACH
01081* 01086* 01087* 01088* 01090* 01097* 01098 01101
01102 01103 01104 01108 01202* 01316* 01405 01406
01528 01752 01775
SECRETION,KIDNEY ELECTROLYTE
01613 01669
SECRETION,NERVOUS CONTROL OF STOMACH
01083* 01097* 01100 01103 01104 01294 01406 01410
SECRETION,PANCREAS
01109* 01110* 01113* 01114 01115 01116 01143* 01220
01229 01469 01507* 01528
SECRETION,PANCREAS AMYLASE
01111* 01113* 01143*
SECRETION,PANCREAS BICARBONATE
01087* 01109* 01411
SECRETION,PANCREAS CHYMOTRYPSIN
01111*
SECRETION,PANCREAS ENZYME
01581
SECRETION,PANCREAS LIPASE
01102 01241
SECRETION,PANCREAS PHOSPHOLIPASE A
01516*

SECRETION,PANCREAS PROTEASE
01438 01508
SECRETION,PANCREAS PROTEIN
01087* 01113* 01143*
SECRETION,SALIVARY GLAND
01078* 01114
SECRETION,SMALL INTESTINE
01097*
SECRETION,STOMACH
01033 01085* 01095* 01201* 01267 01304* 01315* 01403
01760
SECRETION,STOMACH ACID
01045* 01080* 01081* 01082* 01083* 01084* 01086* 01087*
01088* 01090* 01091* 01092* 01093* 01094* 01096* 01097*
01098 01099 01101 01102 01103 01107 01117* 01186
01202* 01216* 01249 01306* 01316* 01319* 01327 01389*
01390* 01394* 01397* 01401 01405 01406 01412 01419
01528 01726* 01752 01766 01774
SECRETION,STOMACH ELECTROLYTE
01085* 01088* 01096* 01099
SECRETION,STOMACH LIPASE
01046*
SECRETION,STOMACH MUCUS
01086*
SECRETION,STOMACH PEPSIN
01080* 01086* 01088* 01327
SECRETION,STOMACH TRACE ELEMENT
01096*
SECRETOR STATUS,BLOOD GROUP
01304*
SEROLOGICAL DIAGNOSIS
01230 01430* 01433 01455 01487 01510 01628* 01734*
01755 01764
SEROTONIN
SEE ALSO CARCINOID SYNDROME
01115 01306* 01401 01682 01735* 01736*
SERUM BILE PIGMENTS
01558
SERUM BILE PIGMENTS IN JAUNDICE
01168 01203*
SERUM CHOLESTEROL
01737
SERUM ELECTROLYTES
01547*
SERUM ENZYMES
01222 01764
SERUM ENZYMES,LIVER
SEE ALSO ALKALINE PHOSPHATASE
01195* 01206* 01209* 01218* 01221 01225 01247 01536*
01539* 01550* 01552* 01558 01567 01606* 01615 01619
01627* 01630* 01643
SERUM HEPATITIS
01629* 01645
SHIGELLOSIS
SEE ALSO DYSENTERY
01793 01794
SHIGELLOSIS DIAGNOSIS
01757
SHIGELLOSIS EPIDEMIOLOGY
01757
SHIGELLOSIS IMMUNOLOGY
01783 01784 01785 01795 01796 01797
SHIGELLOSIS IN CHILDREN
01734*
SHIGELLOSIS TREATMENT
01773 01783 01784 01785 01797
SHOCK
01246 01383 01414 01523 01549* 01580 01729* 01733*
01776 01812
SHUNT,PORTACAVAL
01191 01291 01541* 01546* 01587 01588 01589 01590
01591 01647* 01652* 01658 01670 01760
SIGMOID
SEE ALSO LARGE INTESTINE
01465 01467
SIGMOIDITIS
01486
SIGMOIDOSCOPY
01265 01761 01770
SIMPLE NONSPECIFIC ULCERS
SEE NONSPECIFIC ULCERS
SLEEP
01418
SMALL INTESTINE
SEE ALSO DUODENUM
SEE ALSO ENTERITIS
SEE ALSO ILEOCECAL VALVE
SEE ALSO ILEUM
SEE ALSO ILEUS
SEE ALSO INTUSSUSCEPTION
SEE ALSO JEJUNUM
SEE ALSO MALABSORPTION
SEE ALSO PEPTIC ULCERS
01024*
SMALL INTESTINE ABSORPTION
01036* 01038* 01039* 01040* 01041* 01043* 01044* 01047*
01048* 01049* 01050* 01053 01055 01056 01057 01058
01059 01060 01062 01063 01064 01176* 01183* 01351*
01353* 01357* 01370 01373 01374 01375 01426* 01434
01437 01438 01439 01760 01793
SMALL INTESTINE ANOMALIES
01322 01358 01362 01363 01385 01512
SMALL INTESTINE BIOCHEMISTRY
01005* 01008* 01016* 01020* 01023* 01040* 01043* 01044*
01050* 01056 01062 01176* 01179* 01180* 01182* 01183*
01442 01711 01712
SMALL INTESTINE BIOPSY
01183* 01197* 01442 01758 01762
SMALL INTESTINE CANCER
01364 01380 01725* 01780
SMALL INTESTINE CIRCULATION
01012* 01025* 01350* 01357* 01377 01385
SMALL INTESTINE DEVELOPMENT
01008* 01016* 01022* 01023* 01028 01178*
SMALL INTESTINE DIAGNOSIS
01197* 01198* 01199* 01210* 01240 01251 01258 01350*
01359 01362 01364 01366 01378 01429*
SMALL INTESTINE DISACCHARIDASES
01040* 01182* 01183* 01436 01745
SMALL INTESTINE DISEASES
01369 01382 01769 01804
SMALL INTESTINE DIVERTICULA
01360 01369 01382
SMALL INTESTINE ENZYMES
01005* 01008* 01016* 01022* 01023* 01033 01044* 01180*
01182* 01183* 01438
SMALL INTESTINE FISTULAS
01041* 01375 01751
SMALL INTESTINE HISTOLOGY
01005* 01028 01177* 01178* 01197* 01351* 01353* 01442
01729* 01762 01807
SMALL INTESTINE IMMUNOLOGY
01353* 01370 01430*
SMALL INTESTINE IN CHILDREN
01183* 01358 01359 01363 01365 01376
SMALL INTESTINE INJURIES
01352* 01355* 01383
SMALL INTESTINE LIPID METABOLISM
01020*
SMALL INTESTINE METABOLISM
01022* 01023* 01177*
SMALL INTESTINE MICROORGANISMS
01729* 01776
SMALL INTESTINE MORPHOLOGY
01024* 01063 01328
SMALL INTESTINE MOTILITY
01068* 01190 01210* 01354* 01381
SMALL INTESTINE MUCOSA
01005* 01007* 01012* 01020* 01022* 01023* 01024* 01028
01039* 01043* 01058 01060 01062 01063 01079 01177*
01179* 01180* 01182* 01183* 01328 01350* 01353* 01362
01370 01375 01428* 01429* 01438 01440 01442 01468
01738
SMALL INTESTINE NEOPLASMS
01258 01369 01382 01429*
SMALL INTESTINE NEOPLASMS,BENIGN
01199* 01484
SMALL INTESTINE NEOPLASMS,MALIGNANT
01199* 01360 01364 01380 01384 01758
SMALL INTESTINE OBSTRUCTION
01240 01258 01309* 01322 01347 01350* 01355* 01358
01362 01363 01366 01367 01368 01378 01425 01468
01511 01532 01707 01751 01763 01769
SMALL INTESTINE PATHOLOGY
01351* 01423* 01428* 01429* 01454* 01776
SMALL INTESTINE PERFORATION
01359 01376 01382 01423* 01707 01722*
SMALL INTESTINE PERFUSION
01038* 01041* 01087* 01351*
SMALL INTESTINE POLYPS
01359
SMALL INTESTINE RADIOLOGY
01197* 01199* 01210* 01240 01251 01258 01350* 01359
01378 01429* 01756
SMALL INTESTINE SECRETION
01097*
SMALL INTESTINE STRICTURE
01258
SMALL INTESTINE SURGERY
01318* 01352* 01354* 01356* 01357* 01358 01361 01363
01364 01367 01368 01371 01372 01373 01374 01376
01377 01381 01385 01386 01425 01426* 01431 01532
01722* 01807
SMALL INTESTINE TRANSPLANTATION
01352* 01353* 01370 01510
SMALL INTESTINE TRAUMA
01376 01383

SMALL INTESTINE TREATMENT
01367
SMALL INTESTINE ULCERS,NONSPECIFIC
01258 01350* 01382
SMALL INTESTINE ULTRASTRUCTURE
01012* 01024* 01028 01037* 01177* 01179*
SMALL INTESTINE VOLVULUS
01363
SMALL INTESTINE,AGE EFFECTS ON
01016* 01031 01033 01038* 01368
SMALL INTESTINE,DRUG EFFECTS ON
01008* 01022* 01049* 01068* 01350* 01423*
SMALL INTESTINE,HORMONAL CONTROL OF
01008* 01022* 01063 01190
SMALL INTESTINE,NERVOUS CONTROL OF
01024* 01776
SMALL INTESTINE,TOXIC EFFECTS ON
01037* 01350* 01423* 01776
SMOOTH MUSCLE PHARMACOLOGY
01068* 01075* 01482
SMOOTH MUSCLE PHYSIOLOGY
01075*
SODIUM
01060
SODIUM ABSORPTION
01186 01437
SPASMS,ESOPHAGUS
01261 01283 01293
SPHINCTER OF ODDI
SEE ALSO BILIARY TRACT
01515 01681* 01690 01695 01700 01718
SPHINCTER,ANUS
01214* 01477 01489
SPHINCTER,ESOPHAGUS
01035 01069* 01074* 01261 01273* 01293 01294 01299
SPLEEN
01602 01659 01667 01781
SPLENOMEGALY
01429* 01673 01762 01781
SPLENOPORTOGRAPHY
01248
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01183* 01441 01770
SPRUE,TROPICAL
01427*
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01035 01569 01701
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01180*
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01361 01426* 01429* 01432 01434 01435 01708 01770
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01543*
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01176*
STEROID EXCRETION
01176*
STEROID METABOLISM
01176* 01184
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01559 01639
STEROIDS
SEE ALSO CORTICOSTEROIDS
SEE ALSO LIVER CHOLESTEROL METABOLISM
01145* 01148* 01170 01683
STOMACH
SEE ALSO GASTRITIS
SEE ALSO PYLORIC OBSTRUCTION
SEE ALSO ULCERS
01308*
STOMACH ABSORPTION
01045* 01046*
STOMACH ACID SECRETION
01045* 01080* 01081* 01082* 01083* 01084* 01086* 01087*
01088* 01090* 01091* 01092* 01093* 01094* 01096* 01097*
01098 01099 01101 01102 01103 01107 01117* 01186
01202* 01216* 01249 01306* 01316* 01319* 01327 01389*
01390* 01394* 01397* 01401 01405 01406 01412 01419
01528 01726* 01752 01766 01774
STOMACH ANOMALIES
01322 01512
STOMACH BIOCHEMISTRY
01046* 01089* 01105
STOMACH BIOPSY
01007*
STOMACH CANCER
01007* 01096* 01194* 01228 01282 01304* 01311* 01312*
01320* 01321* 01324 01329 01330 01332 01333 01335
01336 01609 01725* 01733* 01780 01782
STOMACH CARCINOGENESIS
01387*
STOMACH CIRCULATION
01025* 01192 01305* 01390*
STOMACH CYTOLOGY
01095*
STOMACH DEVELOPMENT
01010* 01095* 01106
STOMACH DIAGNOSIS
01096* 01193* 01194* 01198* 01204* 01210* 01216* 01228
01238 01250 01256 01267 01270 01305* 01308* 01310*
01324 01325 01334 01336 01346 01772
STOMACH DISEASES
01216* 01334
STOMACH ELECTROLYTE SECRETION
01085* 01088* 01096* 01099
STOMACH ENDOSCOPY
01193* 01194* 01204* 01269 01270 01305* 01334
STOMACH ENZYMES
01033 01046* 01189
STOMACH FISTULAS
01082* 01084* 01086* 01091* 01093* 01201* 01478
STOMACH HISTOLOGY
01010* 01309* 01315* 01324 01344 01390* 01392* 01397*
STOMACH IN CHILDREN
01099 01310*
STOMACH INJURIES
01306* 01342 01344 01348 01760
STOMACH INTRINSIC FACTOR
01327
STOMACH LIPASE SECRETION
01046*
STOMACH METABOLISM
01089* 01105 01106
STOMACH MORPHOLOGY
01238 01308*
STOMACH MOTILITY
01059 01072* 01083* 01190 01201* 01210* 01238 01255
01316* 01334 01421
STOMACH MUCOSA
01007* 01010* 01045* 01046* 01084* 01085* 01086* 01089*
01095* 01100 01106 01201* 01270 01304* 01305* 01306*
01307* 01309* 01315* 01316* 01325 01327 01333 01342
01389* 01390* 01405 01416 01686 01760
STOMACH MUCOSAL INJURIES
01105 01348 01397*
STOMACH MUCUS SECRETION
01086*
STOMACH NEOPLASMS
01216* 01336
STOMACH NEOPLASMS,BENIGN
01346
STOMACH NEOPLASMS,MALIGNANT
01312* 01321* 01323 01324 01332 01402
STOMACH OBSTRUCTION
01287
STOMACH PATHOLOGY
01007* 01228 01269 01312* 01315* 01321* 01329 01342
01346 01403 01724*
STOMACH PEPSIN SECRETION
01080* 01086* 01088* 01327
STOMACH PERFORATION
01204* 01310* 01319* 01322
STOMACH PERFUSION
01072*
STOMACH POLYPS
01336
STOMACH RADIOLOGY
01198* 01210* 01238 01250 01256 01262 01269 01270
01308* 01334 01346 01403
STOMACH SECRETION
01033 01085* 01095* 01201* 01267 01304* 01315* 01403
01760
STOMACH SECRETION DISORDERS
01090* 01216* 01327 01334 01336 01421 01742
STOMACH SECRETION IN DISEASE
01410
STOMACH SECRETION STUDY TECHNIQUES
01046* 01082* 01084* 01094* 01099 01104 01107 01108
01202* 01249 01254 01388* 01388*
STOMACH SECRETION,DRUG EFFECTS ON
01088* 01091* 01092* 01093* 01094* 01306* 01401 01405
STOMACH SECRETION,HORMONAL CONTROL OF
01081* 01086* 01087* 01088* 01090* 01097* 01098 01101
01102 01103 01104 01108 01202* 01316* 01405 01406
01528 01752 01775
STOMACH SECRETION,NERVOUS CONTROL OF
01083* 01097* 01100 01103 01104 01294 01406 01410
STOMACH SURGERY
SEE ALSO GASTRECTOMY
01100 01254 01272* 01279* 01287 01294 01308* 01310*
01314* 01316* 01317* 01324 01329 01334 01340 01391*
01396* 01398* 01403 01404 01408 01417 01419 01422
01700 01752 01760
STOMACH SURGERY TECHNIQUES
01310* 01331 01335 01339 01345 01347 01705
STOMACH TRACE ELEMENT SECRETION
01096*

STOMACH ULCERS
01089* 01262 01307* 01309* 01321* 01387* 01389* 01390*
01392* 01394* 01400 01405 01407 01412 01416 01419
01420 01724* 01730* 01760 01766 01811
STOMACH ULTRASTRUCTURE
01095* 01315* 01344
STOMACH VARICES
01256
STOMACH,AGE EFFECTS ON
01033
STOMACH,DRUG EFFECTS ON
01105 01106 01255 01306*
STOMACH,DRUG TREATMENT OF
01348
STOMACH,NERVOUS CONTROL OF
01072* 01316* 01344 01417
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01305* 01342 01344 01772
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01468 01746
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01162 01172 01496*
STRESS FACTORS IN ULCERS
01089* 01390* 01405
STRICTURE,BILIARY TRACT
01392* 01675* 01702
STRICTURE,ESOPHAGUS
01272* 01274* 01279* 01285 01300
STRICTURE,SMALL INTESTINE
01258
STUDY TECHNIQUES,ABSORPTION
01040* 01041* 01052 01053 01054 01058 01061 01064
01373 01437
STUDY TECHNIQUES,DYE
SEE MARKER STUDIES
STUDY TECHNIQUES,GASTROINTESTINAL CIRCULATION
01192
STUDY TECHNIQUES,RADIOISOTOPE
SEE TRACER STUDIES
STUDY TECHNIQUES,SECRETION
01096* 01109* 01110*
STUDY TECHNIQUES,STOMACH SECRETION
01046* 01082* 01084* 01094* 01099 01104 01107 01108
01202* 01249 01254 01388* 01388*
SUGAR ABSORPTION
01745
SUGAR INTOLERANCE
01436 01754
SULFOBROMOPHTHALEIN
01147* 01217* 01539* 01572
SULFUR METABOLISM
01089*
SURFACE ACTIVE AGENTS
01039*
SURGERY IN CHILDREN
01470
SURGERY TECHNIQUES
01272* 01274* 01280* 01286 01295 01296 01303 01356*
01445* 01460 01481 01483 01489 01504* 01520 01544*
01546* 01549* 01565 01620 01691 01696 01697 01704
01716 01767 01805
SURGERY TECHNIQUES,STOMACH
01310* 01331 01335 01339 01345 01347 01705
SURGERY,ABDOMEN
01287 01383 01455 01467 01473 01479 01515 01521
01527 01747 01753 01762 01767 01779 01811
SURGERY,ANORECTAL
01464 01470 01489
SURGERY,ANUS
01460 01477
SURGERY,APPENDIX
01447* 01474
SURGERY,BILIARY TRACT
01205* 01239 01521 01532 01533* 01544* 01545* 01553*
01560 01561 01675* 01676* 01677* 01678* 01679* 01681*
01687 01688 01689 01690 01691 01692 01693 01696
01697 01698 01699 01702 01703 01706 01707 01709
01712 01716 01718
SURGERY,CANCER
01167 01285 01302 01320* 01329 01332 01335 01445*
01448* 01451* 01480 01483 01484 01490 01503* 01566
01697 01767
SURGERY,CHOLELITHIASIS
01685 01687 01688 01689 01690 01691 01692 01693
01694 01695
SURGERY,DUODENUM
01339 01352* 01364 01697 01699
SURGERY,ESOPHAGUS
01035 01272* 01274* 01277* 01278* 01279* 01281 01284
01286 01287 01290 01291 01295 01296 01299 01303
01605
SURGERY,GALLBLADDER
01676* 01677* 01679* 01702 01703 01704 01717 01718
SURGERY,GASTROINTESTINAL
SEE ALSO GASTROINTESTINAL TREATMENT
01053 01099 01356* 01366 01767 01789 01790 01806
SURGERY,LARGE INTESTINE
01367 01368 01445* 01447* 01451* 01458 01459 01465
01466 01471 01474 01478 01480 01486 01493* 01494*
01497* 01532
SURGERY,LIVER
01013* 01162 01266 01536* 01541* 01546* 01549* 01560
01565 01568 01573 01575 01601 01620 01621 01658
01678*
SURGERY,MESENTERY
01751
SURGERY,PANCREAS
01220 01503* 01504* 01505* 01506* 01507* 01512 01513
01526 01532 01699 01752 01767
SURGERY,PANCREATITIS
01520
SURGERY,PEPTIC ULCER
01069* 01255 01308* 01317* 01339 01340 01388* 01388*
01396* 01398* 01399* 01402 01403 01404 01408 01414
01417 01419 01420 01421 01422 01767
SURGERY,RECTUM
01481 01483 01494* 01497*
SURGERY,SMALL INTESTINE
01318* 01352* 01354* 01356* 01357* 01358 01361 01363
01364 01367 01368 01371 01372 01373 01374 01376
01377 01381 01385 01386 01425 01426* 01431 01532
01722* 01807
SURGERY,STOMACH
SEE ALSO GASTRECTOMY
01100 01254 01272* 01279* 01287 01294 01308* 01310*
01314* 01316* 01317* 01324 01329 01334 01340 01391*
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PREFACE

GASTROENTEROLOGY ABSTRACTS and CITATIONS is a publication of the National Institute of Arthritis and Metabolic Diseases. This specialized information medium has been initiated to fill an existing great need in the field of gastroenterology and to assist the Institute in meeting its obligations to foster and support laboratory and clinical research into the nature, causes, and therapy of diseases of the gastrointestinal tract. Publication of GASTROENTEROLOGY ABSTRACTS and CITATIONS makes available, free to qualified interested investigators and practitioners, citations of all current papers relevant to this field from medical journals published throughout the world. Approximately one-third of the citations dealing with the major aspects of gastroenterology has accompanying abstracts.

The issuing of GASTROENTEROLOGY ABSTRACTS and CITATIONS under the auspices of the National Institute of Arthritis and Metabolic Diseases will provide a much needed current awareness tool to scientists and will facilitate greater integration of research and clinical efforts in this field. The number and great diversity of publications in the area of gastroenterology makes it imperative that an appropriate service be available to investigators and practitioners so that they may be apprised of progress with a minimum of delay. Our aim is to provide the readers with a readily systematized compilation of current published work. The publication will provide the greatest usefulness if these interested investigators will contribute their ideas and comments for consideration whenever possible.

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NOTE

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LANGUAGE ABBREVIATIONS

Afr.	Afrikaans	It.	Italian
Ar.	Arabic	Jap.	Japanese
Bul.	Bulgarian	Kor.	Korean
Ch.	Chinese	Latv.	Latvian
Cz.	Czech	Lith.	Lithuanian
Dan.	Danish	Nor.	Norwegian
Dut.	Dutch	Pol.	Polish
E.	English	Por.	Portuguese
Eston.	Estonian	Rum.	Rumanian
Fin.	Finnish	Rus.	Russian
Fl.	Flemish	Ser.	Serbo-Croatian
Fr.	French	Sl.	Slovak
Ger.	German	Sp.	Spanish
Gr.	Greek	Sw.	Swedish
Heb.	Hebrew	Th.	Thai
Hun.	Hungarian	Turk.	Turkish
Ic.	Icelandic	Uk.	Ukrainian
In.	Indonesian	Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone
ADP	adenosine diphosphate
AMP	adenosine monophosphate
ATP	adenosine triphosphate
BSP	sulfobromophthalein
C	degrees centigrade
cm	centimeter(s)
CNS	central nervous system
cpm	counts per minute
DNA	deoxyribonucleic acid
e.g.	for example
g	gram(s)
µg	microgram(s)
hr	hour(s)
i.m.	intramuscular
i.p.	intraperitoneal
IU	international unit(s)
i.v.	intravenous
kg	kilogram(s)
LD50	median lethal dose(s)
LDH	lactic acid dehydrogenase
m	meter(s)
M	molar
mEq	milliequivalent(s)
mM	millimolar
µM	micromolar

mC, µC	milli-, microcurie(s)
mg	milligram(s)
min	minute(s)
ml	milliliter(s)
mm	millimeter(s)
MTD	maximum tolerated dose
ng	nanogram (10^{-9})
pg	picogram (10^{-12})
p.o.	orally
ppm	parts per million
r	Roentgen
RBC	red blood cells (erythrocytes), red blood count
resp.	respectively
Rev.	review (only in citations)
RNA	ribonucleic acid
s.c.	subcutaneous
sec	second(s)
SGOT	serum glutamic-oxalacetic transaminase
SGPT	serum glutamic-pyruvic transaminase
U	unit(s)
UV	ultraviolet
WBC	white blood cells (leukocytes), white blood count
yr	year(s)

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

14 **THE TIME DEPENDENCE OF THE CONCENTRATION OF 5-HYDROXYTRYPTAMINE D STAINING CHARACTERISTICS OF ENTEROCHROMAF- N CELLS IN THE HUMAN DUODENUM POST-MORTEM.** *)* Penttilä, A. (Dept. Anat., U. Helsinki, Finland) and K. ıla. *Deutsch Z Ges Gerichtl Med* 65(1):32-43, 1969.

e postmortem levels of 5-hydroxytryptamine (5-HT), rmaldehyde-induced fluorescence, argyrophilia, and 3 other ining reactions were studied in enterochromaffin cells (EC) the human duodenum in 101 cadavers which had been stored 2-77 hr at room temperature and 0-215 hr at 4C. The odenal 5-HT level was zero in only 1 case, and did not cor- ate with storage time at either room or cold temperature; a v correlation ($p < 0.01$) was found, however, between the ine level and the total storage time. A significant reduction 5-HT occurred with time on the autopsy table. Argyrophil lls were found in the duodenum in most specimens but isson-Fontana-positive argentaffin EC were found in only a v. Positive EC were revealed occasionally by the diazo- upling reaction, but there were no positive EC in the ferric ricyanide or indophenol reactions. Postmortem autolysis is followed by increased autofluorescence of the duodenal sue which masked the formaldehyde-induced fluorescence of e EC; the latter is less suitable for the demonstration of EC an the silver reactions. It is concluded that the intestinal HT level, by itself, is not a suitable method for the deter- ination of the approximate time of death.

15 **THREE DIFFERENT SYSTEMS OF MONOAMINE-STORING CELLS IN THE GASTRO- TESTINAL TRACT OF FETAL AND NEONATAL RATS.** *.)* Håkanson, R. (Dept. Pharmacol., U. Lund, Sweden), C. wman and N. O. Sjöberg. *Acta Physiol Scand* 75(1/2):213- 0, 1969.

e development of 3 monoamine-storing cell systems in the all of the duodenum, glandular portion of stomach, and ileum as followed histochemically in fetal and newborn rats, and mpared with the number and characteristics of such cells in lults. 5-Hydroxytryptamine could already be demonstrated mast cells and enterochromaffin cells a few days before birth. art of the mast cell population, i.e., the part which in adult imals is found as "atypical" mast cells near the mucosal sur- ce, was able to take up large amounts of dihydroxyphenyl- anine (DOPA). "Enterochromaffin-like" cells, exclusively und in the oxyntic gland area of the gastric mucosa, were so able to take up, and probably decarboxylate, DOPA at irth. Their number increased progressively in the following ages. Gastric DOPA decarboxylase activity was already high a stage when the capacity to store monoamines had not yet eveloped in the enterochromaffin-like cells, the system of onoamine cells quantitatively dominating in the stomach wall. his finding suggests that DOPA decarboxylase also occurs in ther cell systems, such as mast cells and enterochromaffin ells, which are capable of storing monoamines earlier than the nterochromaffin-like cells. The activity of gastrointestinal OPA decarboxylase already reaches adult levels by the time f birth, and is probably primarily associated with the two ystems of enterochromaffin and enterochromaffin-like cells.

1816 **INTRACELLULAR DISTRIBUTION OF LIPASE IN COMPARISON TO TRYPSINOGEN, AMYLASE AND IMMEDIATELY MEASURABLE TRYPSIN INHIBITOR(S) IN THE RAT PANCREAS.** *(E.)* Arnesjo, B. (Chem. Ctr., U. Lund, Sweden) and A. Grubb. *Acta Physiol Scand* 75(1/2): 139-148, 1969.

The intracellular distribution of lipase (glycerol ester hydrolase), trypsinogen, amylase and immediately-measurable trypsin inhibitor(s) was studied by means of isopycnic gradient centrifugation of rat pancreatic homogenates. A modified method for the measurement of trypsinogen is presented and a micromethod for the estimation of trypsin inhibitory activity is described. By comparison with lipase, smaller proportions of the total trypsinogen and amylase activities were recovered from the zymogen fractions. The total immediately-measurable trypsin inhibitory activity was mainly localized in the cytomembrane fractions, while virtually no activity was found in the zymogen granules. The specific activity (activity per mg protein) for both amylase and trypsinogen was high in the zymogen and in the cell sap fractions. For lipase and immediately-measurable trypsin inhibitory activity, however, the specific activity was high only in the zymogen granules and cytomembranes, resp.

1817 **HISTOCHEMICAL ANALYSIS OF THE ACTIVITY OF DEHYDROGENASES DURING THE EMBRYONIC DEVELOPMENT OF THE HUMAN LIVER.** *(Fr.)* Roman, I. C. (Inst. Forensic Med., Bucharest, Romania). *Acta Histochem (Jena)* 13:339-344, 1968.

Enzyme activities were determined on liver slices from 2-5-month-old human embryos. The activities of diaphorases, Krebs cycle enzymes (succinate, isocitrate, and malate dehydrogenases), and lipoic acid dehydrogenase increased from 4 months until birth. The activities of enzymes involved in aerobic glycolysis (lactate, α-glycerophosphate, and ethanol dehydrogenases) and the pentose shunt (glucose-6-phosphate and 6-phosphogluconate dehydrogenases) were high in 2- and 3-month-old embryos, but decreased around the 4th month and remained low until birth.

1818 **ADRENERGIC INNERVATION OF THE CARDIA, PYLORUS, AND ANAL CANAL IN THE GUINEA PIG.** *(It.)* Gabella, G. (Inst. Norm. Human Anat., U. Turin, Italy) and M. Costa. *Boll Soc Ital Biol Sper* 44(14):1160-1162, 1968.

Adrenergic innervation of the cardia, pylorus, and anal canal was studied in adult guinea pigs using the fluorescence microscopic technique of Falck and Hillarp. The density of adrenergic fibers in the muscular tunics and muscularis mucosae was higher in the cardia and the anal canal than in any other part of the gastrointestinal tract. In the pylorus there was an abrupt change from the arrangement of nerve fibers characteristic of the stomach to that characteristic of the duodenum. The change between the cardia and gastric corpus was gradual.

1819 **HISTOCHEMICAL PROPERTIES OF REGENERATING MUCOUS MEMBRANE IN THE RAT STOMACH.** *(E.)* Lempinen, M. (Dept. Anat., U. Helsinki, Finland), A. Penttilä and G. Fock. *Scand J Gastroent* 3(6):561-571, 1968.

The renewal of the gastric mucosa in the rat was studied by ordinary histological methods using 9 histochemically demonstrable enzyme. Two methods were employed to induce defects: mucosal stripping and peritoneal covering. Both techniques disrupted the mucous muscular layer. Three weeks later there was an incomplete covering of the ulcering defect but 8-16 weeks later the site of the defect was covered by a new but altered and non-mature mucosa. First a single-layered epithelial cell sheet extended towards the center of the defect and was followed later by irregular glandular development and by the appearance of cysts in the new mucosa. In the peritoneal covering method a stratified epithelial cell layer was sometimes found at the center of the defect among the new glandules. The muscular layers of the gastric wall exhibited only minor regenerative capacity. In histological staining, the new mucosal cells greatly resembled normal mucous neck cells and only a few cells similar to parietal cells were seen. Chief cells could not be identified with certainty. The enzyme patterns of the new and the normal epithelium greatly resembled each other. Despite their similar morphological appearance, the regenerated mucosal glandular cells exhibited enzyme patterns different from those of normal mucous neck cells. Neither did the enzyme patterns of the new and old glandular cells in the regenerated mucosa resemble each other. At the borderline of the normal and regenerated mucosa, regenerated parietal cells were found in all the rats, and they were strongly succinic dehydrogenase- and cytochrome oxidase-positive.

1820 **EXCITATORY ADRENERGIC RECEPTORS IN THE HUMAN STOMACH AND PYLORUS.** *(E.)* Haffner, J. F. W. (Ullevål Hosp., Oslo, Norway), I. Liavag and Setekleiv. *Scand J Gastroent* 4(2):145-150, 1969.

The responses to cholinergic and adrenergic drugs in 60 human muscle strip preparations from 11 stomachs resected for gastric cancer or peptic ulcer have been studied *in vitro*. Acetylcholine and carbacholine induced contractions in all preparations tested. The responses were blocked by atropine. The response to adrenaline and noradrenaline elicited contractions in some preparations; in others biphasic responses or inhibition was obtained. Reversal of the response was also produced in some preparations by increasing the dose. The studies indicate excitatory adrenergic α-receptors in addition to inhibitory α- and β- receptors.

1821 **THE RESPONSE OF HUMAN GASTRIC TISSUE EOSINOPHILS TO ACTH INFUSION AND TO LONG-TERM TREATMENT WITH PREDNISONE.** *(E.)* Siurala, M. (U. Cent. Hosp., Helsinki, Finland), T. Räsänen and K. Varis. *Scand J Gastroent* 4(2):209-212, 1969.

Three hr after i.v. infusion of 60 U of ACTH, a marked increase in gastric tissue eosinophilia occurred in 3 of the 5 patients given this hormone; a significant decrease in all cases occurred 6 hr after treatment. After 120 units of ACTH, mucosal eosinophils showed a significant decrease in all cases 8 hours after the start of the treatment. In both experiments blood eosinophils showed a continuous and strong decrease in all cases. Long-term treatment with 20 mg/day of prednisone caused a significant decrease of gastric mucosal eosinophilia at 2 weeks, followed by an additional decrease 12 weeks after the start of the treatment.

1822 **CLOFIBRATE-INDUCED CHANGES IN THE ACTIVITY OF HUMAN INTESTINAL ENZYMES.** *(E.)* Zakim, D. (Fitzsimons Gen. Hosp., Denver, Col.), R. H. Herman, N. S. Rosensweig and F. B. Stifel. *Gastroenterology* 56(3):496-499, 1969.

The administration of clofibrate (ethylchlorophenoxyisobutyrate, 2.0 g/day) to 3 normal males led to decreases in the activity of jejunal glucokinase, glucose-6-P dehydrogenase, fructokinase, and fructose-1-P and fructose-1-6-P aldolases. This effect of clofibrate was specific since 6-phosphogluconate dehydrogenase and hexokinase activities were not altered by the drug. These data suggest a possible mechanism for the triglyceride-lowering effect of clofibrate, and also indicate a new approach to the study of drug action in man.

1823 **DISTRIBUTION OF A BASIC AZO-DYE-BINDIN PROTEIN IN NORMAL RAT TISSUES AND CARCINOGEN-INDUCED HEPATOMA.** *(E.)* Baldwin, R. W. (British Empire Cancer Campaign Res. Lab., U. Nottingham, England), C. R. Barker and M. Moore. *Brit J Cancer* 22(4): 776-786, 1968.

1824 **SALIVARY GLANDS OF THE HAMSTER. I. THE SUBMANDIBULAR GLAND: A HISTOCHEMICAL STUDY AFTER PRESERVATION WITH VARIOUS FIXATIVES.** *(E.)* Flon, H. (Dept. Anat., New York U., N. Y.) and R. Gerstner. *Acta Histochem* 31(2):234-253, 1968.

1825 **AZOPROTEINS OF LIVER NUCLEI ISOLATED IN AN AQUEOUS OR NONAQUEOUS MEDIUM FROM RATS FED AN AZOCARCINOGEN.** *(E.)* Bakay, B. (Inst. Cancer Res., Philadelphia, Pa.), S. Sorof and G. Siebert. *Cancer Res* 29(1):28-32, 1969.

1826 **INORGANIC PYROPHOSPHATE CONTENT IN ADULT GUINEA PIG LIVER.** *(E.)* Flodgaard, H. (Dept. Biochem., U. Copenhagen, Denmark). *FEBS Letters* 2(4):209-212, 1969.

1827 **THE LYMPHATIC BED OF THE CAT SMALL INTESTINE.** *(Rus.)* Mel'nikova, K. V. (Ivanovo Med. Inst., USSR). *Arkh Anat* 56(1):95-99, 1969.

1828 **STRUCTURE AND FUNCTION OF THE GLYCOCALYX.** *(E.)* Ito, S. (Harvard Med. Sch., Boston, Mass.). *Fed Proc* 28(1):12-25, 1969.

1829 **HAMSTER INTESTINAL BRUSH-BORDER SURFACE PARTICLES AND THEIR FUNCTION.** *(E.)* Johnson, C. F. (Indiana U. Sch. Med., Indianapolis). *Fed Proc* 28(1):26-29, 1969.

1830 **FRACTIONS OF THE BRUSH BORDER.** *(E.)* Eichholz, A. (Rutgers Med. Sch., New Brunswick, N. J.). *Fed Proc* 28(1):30-34, 1969.

1831 **COLUMN CHROMATOGRAPHY OF HUMAN SMALL-INTESTINAL MALTASE, ISOMALTASE AND INVERTASE ACTIVITIES.** *(E.)* Dahlqvist, A. (Dept. Physiol. Chem., U. Lund, Sweden) and U. Telenius. *Biochem J* 111(2):139-146, 1969.

1832 **STRUCTURE AND FUNCTION OF THE NORMAL LIVER: LIVER STRUCTURE.** *(E.)* Scheuer,
. J. (Royal Free Hosp., London, England). *Arq Gastroent*
(1):3-6, 1969.

1833 **RIBOSOME SUBSTRUCTURE IN INTACT MOUSE LIVER CELLS.** *(E.)* Florendo, N. T.
U. Tennessee Med. Sch., Memphis). *J Cell Biol* 41(1):335-339,
969.

1834 **A STUDY OF NEXUSES IN VISCERAL SMOOTH MUSCLE.** *(E.)* Cobb, J. L. S. (Dept. Zool., U.
Melbourne, Victoria, Australia) and T. Bennett. *J Cell Biol*
1(1):287-297, 1969.

1835 **STRUCTURAL BASES OF BLOOD FLOW REGULATION IN THE SMALL INTESTINE.** *(E.)*
ajda, J. (U. Med. Sci., Budapest, Hungary), T. Raposa and
. Herpai. *Acta Morph Acad Sci Hung* 16(3):331-340, 1968.

1836 **THE BIOSYNTHESIS OF THE PROTEIN AND LIPID COMPONENTS OF THE INNER AND OUTER MEMBRANES OF RAT LIVER MITOCHONDRIA.** *(E.)* Beattie, D. S. (City U. New York, N. Y.). *Biochem Biophys Res Comm* 35(1):67-74, 1969.

1837 **PRELIMINARY HISTOCHEMICAL DATA ON THE GASTRIC SUCCINIC DEHYDROGENASE ACTIVITY OF THE RAT TREATED WITH POLYSACCHARIDE C_{16}.** *(It.)* Tessitore, V. (Inst. Gen. Embryol. Histol., U. Palermo, Italy), V. Costa and S. Rigardo. *Boll Soc Ital Biol Sper* 44(11):984-986, 1968.

1838 **THE EFFECT OF SEROTONIN ON SPONTANEOUS SWELLING *IN VITRO* OF RABBIT STOMACH MUCOSA AND LIVER MITOCHONDRIA.** *(It.)* Gastaldi, G. (Inst. Gen. Pathol., U. Genoa, Italy), R. Monacelli, V. Pala and U. M. Marinari. *Fegato* 14(4):567-576, 1968.

See also 1989,2151

1839 **THE EFFECT OF CAFFEINE ON THE RATE OF PERSORPTION.** *(Ger.)* Volkheimer, G. (Charité Hosp., Berlin, Germany), F. H. Schulz, E. Hofer and J. Schicht. *Nutr Dieta (Basel)* 11:13-22, 1969.

The rate of starch persorption was studied in 16 male and female medical students (mean age 24 yr) by counting the number of starch granules in 10-ml blood samples after the ingestion of 200 mg of cornstarch suspended in 200 ml of water. The diameter of the cornstarch granules ranged from 7-22 μ. Simultaneous ingestion of an infusion of 20 g of coffee, containing 228 mg of caffeine, produced a significant increase in starch persorption. This may be due either to increased motility or to increased capillary pulsation in the muscularis mucosae.

1840 **INTESTINAL ABSORPTION OF ^{45}Ca IN THE RAT.** *(Ger.)* Moll, H. (2nd Med. Clin., U. Munich, Germany) and P. Sauer. *Z Ges Exp Med* 149(3):266-276, 1969.

Calcium absorption was measured in fasting male Sprague-Dawley rats 60 min after instillation of 1.0 ml of isotonic saline containing 35-60 μC of ^{45}Ca through a catheter into the jejunum, ileum, or colon. Calcium absorption was significantly faster in the ileum than in the jejunum, and absorption in the jejunum was significantly faster than in the colon. The percentage of ^{45}Ca absorbed was inversely proportional to the concentration of calcium used and absorption followed the Michaelis-Menten equation in all segments studied, suggesting that a carrier system is involved in Ca transport.

1841 **THE MORPHOLOGY OF FAT ABSORPTION IN THE JEJUNUM: A BIOPSY STUDY.** *(Fr.)* Debray, C. (Bichat Hosp., Paris, France), M. Cerf, C. Marche and D. Bertin. *Arch Franc Mal Appar Dig* 58(1/2):5-24, 1969.

Samples of jejunal mucosa were taken by biopsy from 82 normal subjects and patients with gastrointestinal diseases after 12-14 hr of fasting and 5-120 min after instillation of a lipid emulsion (60% corn oil, 20% dextrose, and 20% water) into the distal duodenum or proximal jejunum. In normal subjects who had fasted, no fats were found in cells of the intestine, but lipid inclusions were seen in some histiocytes of the chorion. Five min after administration of the corn oil emulsion, lipid vacuoles appeared as a wave which moved toward the center of the cell. After 30-40 min particles of the 1st of 2 or 3 waves invaded the chorion. The presence of lipid inclusions in intestinal cells of fasting patients with malabsorption syndromes or nonspecific diarrhea appears to be due to disorders in intracellular lipid transport. Normally, instillation of the emulsion did not produce any change in the number or morphology of histiocytes with lipid inclusions in the chorion. These cells were found only in small numbers or not at all in 1 patient with atrophy of the small intestine, gastrectomized patients, and 1 patient with acanthocytosis, but were present in large numbers in some patients with hyperlipemia and 1 patient with nonspecific diarrhea. Thus, these inclusions appear to be independent of the production of chylomicrons and depend upon the nutritional status of the subject. The presence of 2 or 3 successive waves of lipid invasion suggests that discontinuity in absorption might be due either to discontinuity in cell function or differences in the rate of lipid transport at different levels of the cell. The central chyliferous vessels of the villi contained little or no lipids, indicating that their primary function might be to activate lymph circulation rather than to serve as a collector. Disorders in lipid absorption included a delay in lipid absorption which was sometimes accompanied by an abnormal distribution of lipid inclusions.

1842 **THE ABSORPTION OF BILIARY AND NONBILIARY RADIOCOPPER IN THE RAT.** *(E.)* Mistilis, S. P. (Dept. Med., U. Sydney, Australia) and P. A. Farrer. *Scand J Gastroent* 3(6):586-592, 1968.

The 24-hr intestinal absorption of cupric acetate, ethylenediaminetetraacetic acid (EDTA), bile and plasma radiocopper was measured in 68 male Sprague-Dawley rats. Given as ionic or EDTA copper in an intrapyloric dose of 0.5 to 10 μg, 36% was absorbed. In a dose of 50 to 1000 μg, 10% was absorbed. Using biliary copper (from donor animals and collected in 3 fractions namely 0-4, 4-8 and 8-24 hr) in a dose of 0,5 to 10 μg, 13% was absorbed. Less absorption occurred using later bile fractions. Absorption of 2.5 μg of 3 fractions of dialysed bile radiocopper was 15.5%, 12.3%, and 9.5%, resp. Compared with ionic or EDTA copper, biliary copper is poorly absorbed. Parallelism was found between the dialysability of biliary copper in the 3 fractions and the progressive lessening absorption. Malabsorption of biliary copper is probably due to its presence in a bound form, possibly to protein. Similar degrees of malabsorption were also obtained with plasma radiocopper. These findings could explain the zero copper balance in man despite high dietary intake. Although excessive exogenous copper is poorly absorbed, this is still quantitatively significant. Subsequent biliary excretion and malabsorption of biliary copper may represent the major excretory pathway for copper. Biliary copper in a nonbound, diffusible and readily absorbable form could account for increased hepatic and body stores of copper in Wilson's disease.

1843 **EXAMINATION OF THE ROLE OF XANTHINE OXIDASE IN IRON ABSORPTION BY THE RAT.** *(E.)* Awai, M. (Dept. Path., U. Okayama, Japan) and E. B. Brown. *J Lab Clin Med* 73(3):366-378, 1969.

The role of xanthine oxidase in iron absorption was studied in normal and iron-deficient female Sprague-Dawley rats in order to determine whether the high concentration of this enzyme present in the duodenal mucosa might participate in the release of iron from a ferritin intermediate of mucosal iron transfer. Rats made iron deficient by bleeding and dietary iron restriction to increase their iron absorption showed decreased xanthine oxidase activity in their duodenal mucosa, increased liver xanthine oxidase activity, and no change in activity of kidney and spleen. Marked inhibition of xanthine oxidase activity with parenterally administered allopurinol was associated with increased initial (30 min) absorption of ^{59}FeSO$_4$ but diminished total (9 to 11 days) iron absorption. Total absorption of ^{59}Fe-labeled hemoglobin is diminished by allopurinol only in rats with iron-deficiency anemia and not in normal rats. As observed in other less direct studies, xanthine oxidase appears to have an equivocal role in the control of iron absorption of rats.

44 **STUDIES OF INTESTINAL ABSORPTION
AND SECRETION. PART I. TECHNIQUE
OR THE EXTRACORPOREAL PERFUSION OF ANY
EMPORARILY ISOLATED INTESTINAL SEGMENT IN
HE UNANESTHETIZED RAT.** *(Ger.)* Haberich, F. J.
nst. Physiol., Free U. Berlin, Germany), R. Herzer, O. Aziz
d R. Dennhardt. *Z Ges Exp Med* 148(3):223-237, 1968.

new perfusion technique is described for studying intestinal
cretion and absorption on unanesthetized animals (female
prague-Dawley rats) *in vivo.* During a preliminary operation,
e 2 ends of the selected segment of small or large intestine
e provided with inflatable cuffs and indwelling catheters.
fter recovery from the operation, this segment of intestine
n be temporarily isolated by means of the cuffs and perfused
rough the indwelling catheters. Perfusion can be carried
ut either in a closed system with recirculation or in an open
ystem. Changes in fluid volume in the entire system then
orrespond to net transmucosal fluxes, and the solute concen-
ations can be followed either by sampling or by the use of
ppropriate, continuously-measuring transducers. The utility
f the technique is illustrated by 2 examples demonstrating
e net fluxes and changes in sodium concentration during
erfusion of the rat small intestine with water and various
aCl solutions.

1845 **α-AMINOISOBUTYRIC ACID TRANSPORT
AND TISSUE CONCENTRATION AT VARIOUS
NTESTINAL SITES.** *(E.)* Schedl, H. P. (U. Iowa Coll. Med.,
owa City), D. L. Miller, H. D. Wilson and P. Flores. *Amer J
hysiol* 216(5):1131-1138, 1969.

Neutral amino acid transport by the rat small intestine was
tudied by measuring absorption and intestinal tissue uptake
of the nonmetabolized synthetic analogue, α-aminoisobutyric
cid (AIB). Solutions of α-aminoisobutyric acid were perfused
r continuously recirculated through individual intestinal seg-
ments *in situ.* α-Aminoisobutyric acid was measured by count-
ng α-aminoisobutyric acid-^{14}C in perfusates, tissue, and serum.
Absorption was calculated from net disappearance of α-amino-
sobutyric acid from the lumen. For all segments, the absorp-
ion rate was proportional to α-aminoisobutyric acid concentra-
ion from 0.83 to 1×10^4 μM. Statistically significant differ-
ences ($P < 0.001$) for absorption rates validated the following
rank order: midjejunum > duodenum > ileum, α-Aminoiso-
butyric acid was concentrated by intestinal tissues above the
levels in lumen and serum. The intestinal tissue concentration
was least in the segment where absorption was greatest (mid-
jejunum). α-Aminoisobutyric acid given parenterally was also
concentrated least by midjejunal tissue. These studies define
a characteristic pattern of α-aminoisobutyric acid absorption
and tissue accumulation along the length of the small intestine.
Contrary to expectation, the α-aminoisobutyric acid transport
rate and tissue α-aminoisobutyric acid accumulation are not di-
rectly related.

1846 **DEVELOPMENTAL PATTERN OF SOME IN-
TESTINAL TRANSPORT MECHANISMS IN
NEWBORN RATS AND MICE.** *(E.)* Batt, E. R. (Coll. Phys.
Surg., Columbia U., New York, N. Y.) and D. Schachter. *Amer
J Physiol* 216(5):1064-1068, 1969.

The pattern of development of an intestinal transport mecha-
nism for calcium has been studied with newborn rats and mice Slices of various segments of the small intestine and colon were tested for accumulation *in vitro*, and the following pattern was observed. Shortly after birth, in rats, all segments tested accumulated Ca *in vitro*, although the level of activity is considerably less than peak values for older animals. In the first 2 weeks of age the level of accumulation decreases progressively in all segments. Beginning in the 3rd week in rats and mice the Ca mechanism increases progressively in the duodenum, the adult site of maximal accumulation. Corresponding observations on accumulation of 3-O-methylglucose and L-proline in rats demonstrate a widespread distribution in the newborn, with the mechanism present in the colon. Subsequently both mechanisms decrease in the colon, and the hexose transport becomes maximal in the mid-small intestine. The present results and prior observations suggest two general conclusions: many intestinal transfer mechanisms are more widespread shortly after birth and are detected in the colon; development of the adult pattern often begins in the 3rd week which is apparently a critical period for development of intestinal function.

1847 **VITAMIN B_{12} UPTAKE BY HUMAN SMALL BOWEL HOMOGENATE AND ITS ENHANCEMENT BY INTRINSIC FACTOR.** *(E.)* Carmel, R. (Mount Sinai Sch. Med., New York, N. Y.), A. H. Rosenberg, K. S. Lau, R. R. Streiff and V. Herbert. *Gastroenterology* 56(3): 548-555, 1969.

Mucosal homogenates of human ileum were demonstrated to have enhanced vitamin B_{12} uptake in the presence of normal human gastric juice or hog intrinsic factor concentrate. This process was demonstrated to require Ca^{++} or Mg^{++} and to be optimal at pH 6.6 and above. The enhancement was blocked by antibody to intrinsic factor. Pernicious anemia gastric juice and normal and pernicious anemia serum did not enhance vitamin B_{12} uptake. In fact, these substances diminished nonspecific uptake of the vitamin, presumably by binding it and rendering it unadsorbable. "Enhancement" by saliva appeared to be an artifact due to the presence of vitamin B_{12} binders precipitable by centrifugation. Human jejunal mucosa homogenate uptake was not enhanced by intrinsic factor, supporting the concept that the active process of vitamin B_{12} uptake is localized to the ileum. Nonspecific uptake of vitamin B_{12}, unrelated to intrinsic factor, appeared to be uniform in jejunal and ileal mucosa homogenates, and to be unaffected by pH or cations. Poor vitamin B_{12} uptake in some but not other ileal homogenates from patients with regional ileitis suggests that the ileal homogenate technique may be useful in evaluating *in vivo* function of intestinal receptors for the intrinsic factor vitamin B_{12} complex.

1848 **THE EFFECT OF UNABSORBED SUCROSE- OR MANNITOL-INDUCED ACCELERATED TRANSIT ON ABSORPTION IN THE HUMAN SMALL INTESTINE.** *(E.)* Launiala, K. (Child. Hosp., Helsinki, Finland). *Scand J Gastroent* 4(1):25-31, 1969.

The absorption of arginine, xylose, and palmitic acid was studied by a perfusion method in a 50 cm segment of proximal small intestine of three children during normal and accelerated passage of a test solution through the segment. Accelerated transit was induced by substituting sucrose for 150 mmoles/liter of glucose in the test solution in a child with congenital sucrose-isomaltose malabsorption and mannitol in two children with normal intestines. The findings were similar in the normal children and the patient. The transit time through the test segment was shortened by 50-70%, and the absorption of palmitic acid, xylose, and arginine was reduced by an average of 42, 35, and 9.5%, resp. These findings suggest that the slight generalized malabsorption observed in patients with congenital disaccharide malabsorption is due to the hurried passage of intestinal content through the small intestine.

1849 SODIUM-GLUCOSE RELATIONSHIPS DURING INTESTINAL SORPTION IN DOGS. *(E.)*

Heaton, J. W. Jr. (Mayo Grad. Sch. Med., Rochester, Minn.) and C. F. Code. *Amer J Physiol* 216(4):749-755, 1969.

The effect of glucose absorption on sodium sorption was studied in the dog intestine *in vivo* by means of phlorizin inhibition; acute and chronic intestinal loops were used. Phlorizin stopped glucose absorption in the duodenum, jejunum, ileum, and colon. Correlation was found between glucose absorption and sodium insorption in the jejunum in acute and chronic studies and in the ileum in acute studies, but no correlation was noted in the duodenum or colon. A phlorizin-sensitive mechanism for sodium insorption, not present in the colon, was detected in the ileum. In control and phlorizin studies, concentration of sodium in the net sorbed fluid was constant. In the chronic loops, phlorizin inhibited sodium insorption even in the absence of glucose. Phlorizin had little effect on water insorption except in the ileum, where it was reduced. No consistent effect of phlorizin on exsorption of either water or sodium was noted in any segment of bowel. In chronic loops of canine jejunum, ouabain reduced glucose absorption and inhibited sodium insorption.

1850 INTESTINAL TRANSPORT OF AMINO ACIDS AS AFFECTED BY SUGARS. *(E.)*

Reiser, S. (VA Hosp., Indianapolis, Ind.) and P. A. Christiansen. *Amer J Physiol* 216(4):915-924, 1969.

Poorly, or nonmetabolized, actively transported sugars typified by galactose, α-methyl-D-glucoside, and 3-O-methyl-D-glucose at 25 mM concentrations were able to consistently inhibit the intracellular accumulation and medium disappearance of 1 mM valine, lysine, and glycine by everted intestinal sacs from male Wistar rats. The inhibition was always greater in the jejunum than in the ileum. Fructose generally activated amino acid transport and both glucose and fructose significantly relieved the galactose inhibition. Preincubation with the inhibitory sugars did not produce a subsequent inhibition of valine transport while preincubation in leucine did. Only galactose of the sugars tested caused a significant efflux of accumulated valine from the tissue and this was only one-third that produced by leucine at one-half the concentration. The galactose inhibition of valine accumulation occurred very rapidly and was significant at 3 min. Galactose was a partial noncompetitive inhibitor of valine accumulation. These results are best explained on the basis of a competition between amino acids and the inhibitory sugars for a common energy source for transport.

1851 INDEPENDENCE OF FAT ABSORPTION AND PINOCYTOSIS. *(E.)*

Porter, K. R. (Biol. Labs., Harvard U., Cambridge, Mass.). *Fed Proc* 28(1):35-40, 1969.

1852 VITAMIN B_{12} ABSORPTION AND THE INTESTINAL CELL SURFACE. *(E.)*

MacKenzie, I. L. (Boston U. Sch. Med., Mass.) and R. M. Donaldson Jr. *Fed Proc* 28(1):41-45, 1969.

1853 THE PHYSIOLOGY OF FAT DIGESTION AND FAT ABSORPTION. *(Ger.)*

Wagner, A. (Med. Polyclin., U. Heidelberg, Germany). *Hippokrates* 39(23):869-876, 1968.

1854 CONTROL OF IRON ABSORPTION BY THE INTESTINAL EPITHELIAL CELL: REVIEW AND HYPOTHESIS. *(E.)*

Pinkerton, P. H. (Sunnybrook Hosp., Toronto, Canada). *Ann Intern Med* 70(2):401-408, 1969.

1855 CURRENT CONCEPTS OF MEMBRANE STRUCTURE AND FUNCTION. *(E.)*

Korn, E. D. (Natl. Heart Inst., NIH, Bethesda, Md.). *Fed Proc* 28(1):6-11, 1969.

1856 TISSUE TRANSPORT DEFECTS OF DIBASIC AMINO ACIDS. *(E.)*

Segal, S. (Child. Hosp. Philadelphia, Pa.). *Bibl Paediat* 87:56-71, 1968.

See also 1828,1829,1830,2027,2472

57 HYPOTHALAMIC CONTROL OF ADRENERGIC OUTFLOW TO THE STOMACH IN THE CAT.

.) Jansson, G. (Dept. Physiol., U. Göteborg, Sweden), B. isander and J. Martinson. *Acta Physiol Scand* 75(1/2):176-36, 1969.

he gastric volume, blood pressure and skeletal muscle blood ow were recorded in chloralosed, adrenalectomized cats in hich the vagal nerves were cut, but the vagal excitatory fibers the stomach could be activated by electrical stimulation. opical stimulation of the hypothalamic defense area, or surounding "pressor" areas, produced not only the characteristic rculatory responses, but also a prompt and often complete hibition of a vagally induced increase in gastric motility. owever, when the stomach was not under the influence of ontinuous vagal excitatory activity, corresponding stimulation f the hypothalamus rarely had any effect on gastric volume, nd then produced only an insignificant and sluggish increase espite considerable "myogenic" tone of the stomach. Stimulaion of the adjacent hypothalamic sympatho-inhibitory area, n the other hand, augmented the vagally induced gastric moility, suggesting the presence of a centrally induced suppression f a prevailing sympathetic inhibitory influence on the stomach. ll the effects on gastric volume produced by central nervous timulation could be blocked by guanethidine in these vagotoized cats. It is concluded that the hypothalamus contains eural mechanisms which can affect stomach motility by changng (in both directions) the impulse frequency in the inhibitory drenergic outflow to the organ. Simultaneous activity of vagal xcitatory fibers to the stomach was found to be a prerequisite or reducing gastric motility and tone when the adrenergic fibers vere excited. This is compatible with the hypothesis that the drenergic fibers exert their inhibitory effect mainly, or only, y acting on the parasympathetic ganglionic cells, which mediate the vagal excitatory influence to the gastric smooth muscles.

1858 THE RELATIONSHIP OF ILEAL OUTFLOW TO COLONIC PROPULSION.

(E.) Ritchie, J. A. Nuffield Dept. Clin. Med., Oxford, England). *Dis Colon Rectum* 12(2):129-136, 1969.

Time-lapse cinefluorography of the colonic movements was used in 120 convalescent volunteers to determine the relations between ileal outflow, colonic propulsion, and individual frequency of bowel movements. The incidence of excessive ileal outflow under resting conditions was nearly 5 times as common as that of moderate outflow in diarrheic subjects. The ileal outflow was increased to some degree after lunch in 2/3 of all subjects; this was attributed to a gastroileal reflex. Ileal outflow was 3 times more likely to be augmented after food ingestion when it was already excessive before the meal. Colonic propulsion averaged 7.5 cm/hr in subjects who had less than 2 movements daily, and 30 cm/hr in those having more frequent movements, and who had been given lunch. During the hour after lunch, the upper limit of colonic propulsion that was consistent with normal bowel function was 22 cm/hr. About 1/4 of the diarrheic patients who had moderate ileal outflow at rest, and in whom there may have been primary colonic hyperactivity, showed propulsion of 30 cm/hr even under resting conditions. Among the subjects with excessive ileal outflow while at rest, an increased frequency of movements in the absence of gastrointestinal disease appeared to be due chiefly to overactivity of the gastroileal and gastrocolic reflexes. In those with disease of the gastrointestinal tract, diarrhea was most often associated with evidence of malabsorption, but still appeared to depend on the same reflex mechanism.

1859 EXTRINSIC INTESTINAL REFLEXES AND MECHANOELECTRICAL CORRELATIONS IN THE DUODENUM AND JEJUNUM OF THE CAT. *(It.)*

Abbadessa, S. (Inst. Gen. Physiol., U. Palermo, Italy) and I. Di Gregorio. *Boll Soc Ital Biol Sper* 44(21):1818-1822, 1968.

Measurements were made of electrical and mechanical activity in the duodena and jejuna of cats anesthetized with 30 mg/kg of metharbital i.v., curarized, intubated, and subjected to artificial respiration. The superior laryngeal nerve was stimulated with impulses having a potential of 3-5 V, a duration of 0.5-1 msec, and a frequency of 10-100 cycles/sec for periods ranging from 15-30 sec. After a lag of 3-8 sec this usually caused rapid and point discharges to appear to increase in number but had little effect on slow rhythmic electrical activity. These changes were associated with an increase in contractile activity. Dilatation of the duodenum with a rubber balloon filled with water had no effect on electrical or mechanical activity in the duodenum and jejunum, while dilatation of the stomach inhibited this activity. Rapid and point discharges disappeared, slow electrical activity became disorganized, and mechanical activity ceased with 80-120 ml H_2O. Dilatation of the ileum first stopped rapid and point discharges and then reduced mechanical activity and produced hypotonia of the duodenal and jejunal walls. Dilatation of the colon had little effect on activity. With 30-40 ml H_2O a temporary decrease occurred in the number of rapid and point discharges and type II contractile waves.

1860 THE EFFECT OF SYNTHETIC BRADYKININ ON THE ISOLATED RAT INTESTINE. *(It.)*

Grossi, F. (Inst. Systematic Med. Ther. Med. Hydrol., U. Rome), M. Grassi and T. Traetta. *Epatologia* 14(1):39-46, 1968.

Isolated segments, about 2.5 cm in length, of the terminal ileum or ascending colon of albino rats were perfused with Tyrode solution and aerated with O_2 at 37C. After 20-30 min, 5 or 10 μg of synthetic bradykinin was added to the solution. After a lag of 3-10 min, bradykinin had a contractile effect on the ileum which lasted for an average of 180 min with 5 μg and 260 min with 10 μg. In the ascending colon bradykinin inhibited spontaneous motility for an average of 90 min. Addition of 10 μg of atropine increased the lag period, reduced the intensity of bradykinin's contractile effect, and reduced the duration of its action. Addition of 10 μg of hexamethonium bromide or isonitrophenylethanolamine increased the lag period only slightly but did not change the intensity of bradykinin's action. These results indicate that bradykinin acts directly on smooth muscles of the intestine and indirectly on cholinergic fibers.

1861 CHANGES IN GASTRIC pH AND MOTILITY DURING NATURAL HUMAN SLEEP. *(Ger.)*

Baust, W. (Neurol. Clin., U. Düsseldorf, Germany) and W. Rohrwasser. *Pflueger Arch Ges Physiol* 305(3):229-240, 1969.

Simultaneous recordings were made of gastric pH and motility with a Heidelberg capsule, EEG, and eye movements in 8 normal male and female subjects, 20-27 yr old. Subjects had dinner at 7:00 p.m. and went to bed between 10:00 and 11:30 p.m. The pH of the gastric contents fluctuated between 1 and 3 in all subjects, remaining constant in some and increasing or decreasing in others. In all subjects gastric motility increased in the 4th hr of sleep, decreased in the 5th hr, and then increased continuously until morning. Gastric motility decreased in deep sleep and increased significantly in the rapid eye movement (REM) period. Gastric acidity was higher in stages B, C, and D than in the waking state. Spontaneous arousal during the night was always accompanied by a decrease in gastric acidity.

1862 THE EFFECT OF EPINEPHRINE, NOREPINEPHRINE, AND EPHEDRINE ON THE TONUS OF THE NERVE ENDINGS IN THE COMMON BILE DUCT. *(Rus.)* Oleinik, A. N. (Ternopol' Med. Inst., USSR). *Farmakol Toksik* 32(1):73-75, 1969.

A pressure method was used to study the effect of i.v. or s.c. administration of 0.625-50 μg/kg of synthetic l-norepinephrine bitartrate, 0.625-50 μg/kg of l-epinephrine hydrochloride, and ephedrine hydrochloride on the tonus of nerve endings in the common bile ducts of 5 dogs with Schiff fistulas of the gallbladder. In 59 of 62 experiments epinephrine and norepinephrine reduced the tonus in untreated animals and in those which had first been given morphine, opium alkaloids, or trimeperidine. The spasmolytic effect of equimolar quantities of epinephrine and norepinephrine was about the same. Ephedrine had a spasmolytic effect similar to, but weaker than, those of epinephrine and norepinephrine. Ephedrine potentiated their spasmolytic action.

1863 THE NERVOUS REGULATORY MECHANISM INVOLVED IN PERIODIC MOTOR AND SECRETORY ACTIVITY IN THE DUODENUM. *(Rus.)* Larin, E. F. (Tomsk Med. Inst., USSR), V. D. Sukhodolo and A. D. Gratsianova. *Fiziol Zh SSSR Sechenov* 55(2):213-220, 1969.

Duodenal motility and the composition of duodenal juice were studied before and after vagotomy on 4 dogs with isolated duodena. After fasting for 18-20 hr, 2 of these dogs had continuous duodenal contractions and increased nonperiodic secretion 4-5 days after vagotomy. Periodic contractions appeared only 10 days after surgery and lasted longer than before vagotomy, while the volume of juice secreted returned to presurgical levels. Four days after surgery the other 2 dogs still had periodic motor and secretory activity. Reductions in solids, proteins, and organic substances were found in duodenal juice from all 4 dogs. Enzyme activity, particularly phosphatase activity, was reduced in the solid part of the secretion. During fasting all 4 dogs showed some evidence of periodic motor and secretory activity 11-20 days after vagotomy. Gradual increases occurred in the secretion of solids and in their enzyme activity, while the enzyme activity of the liquid phase remained low but its protein concentration increased. Fasting duodenal secretion approached presurgical levels in the first 2 dogs but remained low in the others 21 days to 7 months after vagotomy. In both the solid and liquid phases enzyme activities increased to presurgical levels and then decreased. Enzyme activities were higher during periods of activity than during relative rest. Meat, bread, and milk had little effect on the amount of duodenal juice secreted by dogs 4-20 days after vagotomy. The volume of secretion did not depend upon the type of food eaten. Periodic activity returned only 21-26 days after vagotomy. In some cases food only inhibited periodic motor activity, but secretion did occur periodically. From 21 days to 7 months after vagotomy food usually stimulated duodenal secretion, while before surgery food inhibited secretion. Increases in solids and organic matter occurred, particularly after the animals had eaten meat. Total enzyme activity increased significantly.

1864 *IN VITRO* CONTRACTIONS OF RAT JEJUNUM FOLLOWING WHOLE-BODY X-IRRADIATION OR DRUGS. *(E.)* Kagnoff, M. F. (Armed Forces Radiobiology Res. Inst., Bethesda, Md.) and E. Kivy-Rosenberg. *Amer J Physiol* 216(5):1057-1063, 1969.

Adult male rats were sacrificed between 20 min and 3 days following 1500 r whole-body X-irradiation to record and study the spontaneous contractions of isolated *in vitro* segments of jejunum. Segments from nonirradiated animals demonstrated a "multicomponent" irregular pattern of contractions as compared with a "single-component" regular pattern, often associated with an increased contraction amplitude, in segments taken from animals 2 and 3 days after exposure. No increase in the mean rate of spontaneous contractions was noted. The mechanism of this change was studied using pharmacological agents. The ganglionic blocking agent hexamethonium, the anticholinesterase drugs, as well as the neurotoxin tetrodotoxin, when added to the bath containing segments from nonirradiated animals, resulted in a contraction pattern resembling that of segments from animals irradiated 2 and 3 days previously. Evidence is presented, however, which indicates that drug-altered segments differ in some aspects from the irradiation-induced regular segments. The possible mechanisms of the irradiation-induced changes are discussed.

1865 THE EFFECT OF UNABSORBED SUCROSE AND MANNITOL ON THE SMALL INTESTINAL FLOW RATE AND MEAN TRANSIT TIME. *(E.)* Launiala, K. (Child. Hosp., Helsinki, Finland). *Scand J Gastroent* 3(6): 665-671, 1968.

The effect of different concentrations of unabsorbable solute on the movement of water and electrolytes and on the mean transit time was studied in children by perfusing a 50 cm segment of proximal small intestine. Sucrose was the unabsorbable solute used in a child with congenital sucrose-isomaltose malabsorption and mannitol in three normal children. In both cases a steady state was approached in which the intestinal fluid was isotonic to the extracellular fluid and contained about 95 mEq/liter of Na^+ and about 95 mmoles/liter unabsorbable solute and glucose. Concentrations of the test substance exceeding 100 mmoles/liter thus caused net secretion of water and electrolytes. This resulted in an accelerated flow in the distal part of the test segment. The flow rate was further increased by shortening the mean transit time, which was proportional to the content of unabsorbable solute. The findings suggest that in disaccharide malabsorption the increase in intraintestinal volume leads to accelerated transit through the small intestine, in proportion to the quantity of disaccharides ingested.

1866 **EFFECTS OF TRANSECTION ON THE INTESTINAL SLOW-WAVE FREQUENCY GRADIENT.** *(E.)* Diamant, N. E. (Upstate Med. Ctr., Syracuse, N. Y.) and A. Bortoff). *Amer J Physiol* 216(4):734-743, 1969.

As a means of studying the slow-wave frequency gradient, changes in slow-wave frequency and direction of propagation were studied in anesthetized cats and dogs following upper intestinal transection or clamping. Although the *in situ* gradient was greatly reduced or even abolished distal to the level of transection, an intrinsic frequency gradient was readily demonstrable in both species. The direction of slow-wave propagation was apparently determined by the intrinsic frequency gradient and proceeded from an area of higher to one of lower frequency. Occasionally the drop in frequency below the transection was temporarily accompanied by retrograde slow-wave propagation resulting from more distal areas having a transiently higher frequency of discharge. The normal slow-wave pattern and its alterations following transection were not significantly influenced by ganglion-blocking drugs, suggesting that neither process is directly dependent on neurological activity. After its initial drop following transection the slow-wave frequency in the cat gradually rose toward its original value, whereas in the dog it remained at a low level indefinitely. However, in the dog the normal *in situ* gradient could be restored by heating, and thereby raising the frequency of the segment of intestine just distal to the transection. It is concluded that an unknown process in the upper end of the intestine serves to maintain the slow-wave frequency of the initial plateau above its intrinsic level and that the frequency of each subsequent plateau is raised above the intrinsic frequency of its most proximal oscillator by the driving influence of its adjacent, oral plateau.

1867 **PROPULSIVE GASTROINTESTINAL MOTILITY AFTER CONTROLLED BLEEDING IN THE RAT.** *(E.)* Nylander, G. (U. Hosp., Uppsala, Sweden). *Scand J Gastroent* 4(2):105-119, 1969.

The gastric evacuation and propulsive function of the small intestine were analysed after bleedings of different magnitudes in 464 male albino rats. A quantitative method that also allows comparisons between these functions was used. The amount of blood removed varied between 4 and 6 ml, corresponding to 22 and 33 per cent of the total blood volume, resp. Recordings were made immediately after and 5 hr after the bleeding. Bleeding from nonheparinized animals allowed conclusive recordings of the motility conditions; it was concluded that both the gastric evacuation and, in particular, the propulsive motility of the small intestine were inhibited by the bleeding—the larger the amount of blood removed, the greater the inhibition. The small intestine was considered to be an organ with great tolerance to anoxia of different origins. Functions such as motility and absorption can be retained up to a stage very close to that of irreversible shock.

1868 **THE EFFECT OF SOME ORAL ANTICHOLINERGICS ON GASTRIC EMPTYING, pH AND OSMOLARITY IN MAN.** *(E.)* Bromster, D. (Serafimerlassarettet, Stockholm, Sweden), G. Carlberger, G. Lundh, J. Moller and A. Rosen. *Scand J Gastroent* 4(2):185-192, 1969.

The effect of five orally administered anticholinergic drugs on the gastric emptying rate, the pH and the osmolarity of the gastric contents was studied with double-blind technique in 19 healthy male volunteers. The emptying rate was estimated by external counting of ^{131}I-HSA incorporated in a standard liquid test meal. The effect of each drug tested was compared with the response to placebo on each individual since variations between subjects were expected to be large. Atropine (2-4 mg), 1-hyoscyamine (1.4-2.8 mg), and propantheline (1.4-2.8 mg) decreased the gastric emptying rate and reduced the decrease of the pH and the osmolarity induced by the test meal. Methyl scopolamine (8-16 mg) produced inconsistent effects on the parameters. Butylscopolamine (240-480 mg) in a high dose caused some retardation of the emptying but had no effect on pH or osmolarity.

1869 **EFFECT OF GASTRIN AND SC 15396 ON GASTRIC MOTILITY IN DOGS.** *(E.)* Isenberg, J. I. (U. California Sch. Med., Los Angeles) and M. I. Grossman. *Gastroenterology* 56(3):450-455, 1969.

A continuous infusion of porcine gastrin preparations, including crude gastrin, gastrin I, or gastrin II, in doses (0.4 g/kg/hr i.v.) submaximal for gastric acid secretion, stimulated rhythmic antral contractions in the intact stomach or innervated antral pouch of dogs. SC 15396 (2 mg/kg i.v.) markedly decreased gastrin-stimulated gastric acid secretion, but had no effect on gastrin-stimulated antral motility. Provided that the endogenous to exogenous gastrin, stimulation of rhythmic antral contractions should be included as one of the physiological actions of gastrin.

1870 **CHOLINERGIC VERSUS ANTICHOLINERGIC GASTRIC MOTOR EFFECT.** *(E.)* Barowsky, H. (New York Med. Coll., N. Y.) and C. Buganza. *Gastroint Endosc* 15(3):178-180, 1969.

1871 **A MINIATURE MERCURY STRAIN GAUGE FOR CHRONIC NONOBSTRUCTIVE MEASUREMENT OF INTESTINAL MOTILITY.** *(E.)* Ehle, A. L. (Dept. Neurol. Surg., U. Washington, Seattle) and E. L. Foltz. *J Appl Physiol* 26(2):223-226, 1969.

1872 **THE EFFECTS OF EXTRACELLULARLY APPLIED ATP AND RELATED COMPOUNDS ON ELECTRICAL AND MECHANICAL ACTIVITY OF THE SMOOTH MUSCLE TAENIA COLI FROM THE GUINEA-PIG.** *(E.)* Axelsson, J. (Dept. Zoophysiol., U. Göteborg, Sweden) and B. Holmberg. *Acta Physiol Scand* 75(1/2):149-156, 1969.

1873 **VAGO-VAGAL REFLEX RELAXATION OF THE STOMACH IN THE CAT.** *(E.)* Jansson, G. (Dept. Physiol., U. Göteborg, Sweden). *Acta Physiol Scand* 75(1/2): 245-252, 1969.

See also 1820,1839,2021,2104,2540

SECRETION AND METABOLISM

1874 COMPARISON OF THE EFFECTS OF PARASYMPATHETIC AND SYMPATHETIC NERVOUS STIMULATION ON CAT SUBMAXILLARY GLAND SALIVA. *(E.)* Kahn, N. (Coll. Phys. Surg., Columbia U., New York, N. Y.), I. Mandel, J. Licking, A. Wasserman and D. Morea. *Proc Soc Exp Biol Med* 130(1):314-318, 1969.

Stomach

875 SOME FACTORS INFLUENCING THE STIMU-
LATORY EFFECT OF ETHANOL ON GASTRIC
CID SECRETION DURING ANTRUM APPLICATION. *(E.)*
lwin, C. E. (Karolinska Inst., Stockholm, Sweden). *Acta
hysiol Scand* 75(1/2):12-27, 1969.

ariations in gastric secretory response to the antral application
f ethanol were studied in Heidenhain- and Pavlov-pouch dogs
ith isolated, innervated antral pouches in order to determine
e influence of instillation pressure, temperature, concentration,
H and ion composition. Secretory response increased in 2 of
dogs and remained unchanged in 3 dogs during a rise of instil-
tion pressure from 0 to 20-30 cm H_2O. Secretory responses
ere essentially alike, whether alcohol solutions were admin-
tered at room temperature or at body temperature. The
reshold stimulatory concentration was 2-4% (v/v), an optimal
ffect occurred at 8-16%, and a decrease was usually observed
32%. When antral pouches were perfused with buffered
thanol solutions at pH values between 7.0 and 1.0, no signifi-
ant difference in the stimulatory effect was noted within the
H range 7.0-3.0. At pH 2.0 the stimulatory action was de-
reased by about 40% and at pH 1.0 it was almost totally sup-
ressed. The slope of the pH curve was independent of the
thanol concentration, and the pH curves for the stimulatory
ffect of alcohol in the antrum and for vagus stimulation were
lmost identical. The ethanol effect was inhibited by high con-
entrations of K^+ and Ca^{++} but unaffected by corresponding
oncentrations of Na^+ and Mg^{++}.

876 GASTRIC SECRETION OF HYDROCHLORIC
ACID AND PEPSIN IN INDUCED HYPER- AND
YPOCALCEMIA. *(It.)* Rapino, P. (Inst. Gen. Med. Clin.,
. Bologna, Italy), D. Lo Bruno and F. Tabarroni. *Fegato*
4(4):433-450, 1968.

ree and total HCl, pepsin activity, and pH values were deter-
ined in gastric juice from 15 subjects (8 men and 7 women,
ged 18-52 yr) under basal conditions and after i.v. infusion
f 15 mg/kg/120 min of calcium gluconate (8 cases) and 75
g/kg/120 min of disodium ethylenediaminetetraacetic acid
EDTA) (9 cases). None of these subjects had endocrine or gas-
ointestinal disorders. Calcium gluconate increased the volume
f gastric juice secreted in all but 2 cases, reduced its pH in all
ut 2 cases, increased free and total HCl in all cases, and in-
reased the pepsin activity in all but 1. Disodium EDTA sig-
ificantly and progressively reduced the volume of gastric juice
ecreted in all but 1 case, increased the pH in all cases, decreased
he free and total HCl in all but 2 cases, and tended to reduce
epsin activity. These changes in gastric secretion were corre-
ated with changes in blood calcium levels.

1877 STIMULATION OF GASTRIC ACID SECRETION
BY IRRIGATION OF THE ANTRUM WITH
SOME ALIPHATIC ALCOHOLS. *(E.)* Elwin, C. E. (Karolinska
Inst., Stockholm, Sweden). *Acta Physiol Scand* 75(1/2):1-11,
1969.

Ethyl alcohol is known to stimulate gastric acid secretion in fundic-pouch dogs during irrigation of the antrum. A comparative study was therefore carried out, using Heidenhain- or Pavlov-pouch dogs with isolated, innervated, antral pouches, on the gastric stimulatory effects of a series of aliphatic alcohols, including methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, sec-butyl and tert-butyl alcohol. The only alcohol besides ethanol that showed a potent stimulatory effect was n-propyl alcohol. All other alcohols tested had an effect less than half that of ethanol. A change from one stimulatory alcohol to the corresponding isocompound caused a marked decrease in the effect. Isopropyl alcohol, one of the "nonstimulatory" aliphatic alcohols, showed neither a synergistic nor an inhibitory action on the effect of ethyl alcohol or n-propyl alcohol during simultaneous administration, indicating almost no interference with gastrin release mechanisms. n-Propyl alcohol together with ethyl alcohol showed a dose-response related action. Methyl alcohol was almost inactive. These results indicate that the stimulatory effect of alcohols is not related to water or fat solubility but to the molecular configuration.

1878 ACID SECRETION, Na^+ ABSORPTION, AND THE ORIGIN OF THE POTENTIAL DIFFERENCE ACROSS ISOLATED MAMMALIAN STOMACHS. *(E.)* Kitahara, S. (Dept. Physiol., U. Iowa, Iowa City), K. R. Fox and C. A. M. Hogben. *Amer J Dig Dis* 14(4):221-238, 1969.

The potential difference across isolated stomach walls was measured in cats, dogs, rhesus monkeys and humans in order to determine the functional capacity of the stomach wall in isolation. The isolated stomach wall was placed in a double flux chamber and bathed on the serosal surface by a buffered saline solution containing 5.6 mM glucose and on the mucosal surface by the same unbuffered solution. The stomach wall of these species functioned for several hours in isolation. A normal transmural potential difference was generated and H^+ secretion proceeded at a modest rate. The isolated mammalian stomach, to a significant but varying degree, actively absorbed Na^+. To some extent, the prandial state determined Na^+ absorption. Acidification of the solution bathing the mucosal surface of the isolated stomach depressed Na^+ absorption and favored Cl^- secretion.

1879 INHIBITION OF GASTRIC SECRETION BY THE LOCAL ACTION OF ACID ON THE ANTRUM AND ITS RELATION TO VAGAL INNERVATION OF THE ANTRUM. *(Ger.)* Hart, W. (Surg. Polyclin., U. Munich, Germany), K. H. Welsch, W. Brückner, I. Klempa, R. F. Lick, F. J. Schützler and D. Balser. *Z Ges Exp Med* 148(3):183-193, 1968.

After each of 4 dogs had been provided with a vagally denervated Heidenhain pouch; a proximal, vagally innervated, antral pouch; and a distal, vagally denervated, antral pouch, the gastrin mechanism was stimulated by perfusing the antral pouches with buffered meat extract. Perfusion of the innervated antral pouch produced somewhat less secretion in the Heidenhain pouch than perfusion of both antral pouches simultaneously. In both cases there was agreement between the volume of gastric juice and the mEq of HCl secreted. Perfusion of the denervated antral pouch produced significantly less secretion in the Heidenhain pouch than perfusion of both antral pouches simultaneously. Only a moderate decrease in secretion occurred when the innervated pouch was perfused with meat extract and the denervated pouch was perfused with 0.1 N HCl. Thus, perfusion of the denervated antral pouch with acid did not significantly inhibit stimulation of the gastrin mechanism in the innervated antral pouch. The same results were obtained when the innervated antral pouch was perfused with 0.1 N HCl and the denervated antral pouch was perfused with meat extract. Perfusion of both antral pouches with 0.1 N HCl during i.v. infusion of histamine at 0.4 mg/hr reduced secretion in the Heidenhain pouch for 2 hr, while infusion of histamine alone stimulated secretion for 6 hr. No evidence for an inhibitory hormone was found in any of these experiments.

1880 **EFFECT OF ANTRECTOMY ON GASTRIC SECRETION FOLLOWING DUODENAL EXCLUSION.** *(E.)* Richards, E. A. (Karolinska Inst., Stockholm, Sweden) and S. Andersson. *Amer J Dig Dis* 14(4):267-274, 1969.

The effect of antrectomy on stomach acid secretion, stimulated by graded doses of histamine (0.2-6.4 mg/hr i.v.), gastrin (2.5-40 g/hr i.v. in terms of the wet weight of hog antrum mucosa extracted), and a combination of histamine and gastrin plus Urecholine (1.0 mg/hr), was studied in 3 Pavlov-pouch dogs in which the duodenal inhibitory mechanism had been excluded prior to antrectomy. Following transection of the pylorus and closure of the duodenum, the maximal acid response was significantly increased. Subsequent antrectomy produced a highly significant decrease in the acid response to histamine, while gastrin produced only a slight decrease in acid secretion. Resection of the duodenal bulb produced a small decrease in the acid output in response to histamine and a highly significant decrease in response to gastrin. These findings demonstrate the importance of the duodenal inhibitory mechanism in regulating the gastric acid secretory response, and the potentiating effect of spontaneously released gastrin from the antrum on injected histamine. They support the theory that endogenous gastrin is located in the duodenal bulb, and that these minute amounts of gastrin are significant in the regulation of acid secretion.

1881 **SUPPRESSION OF 2-DEOXY-D-GLUCOSE-AUGMENTED GASTRIC SECRETION BY HYPOTHALAMIC LESIONS PRODUCING HYPERPHAGIA.** *(E.)* Ridley, P. T. (George Washington U. Sch. Med., Washington, D. C.) and E. O. Cirpili. *Amer J Dig Dis* 14(4):262-266, 1969.

The effect of 2-deoxy-D-glucose (2-DG, 100 mg/kg s.c.) on gastric secretion was studied in 22 male Sprague-Dawley rats with gastric fistulas, both before and after induction of hyperphagia by ventromedial nuclear hypothalamic lesions. Control studies showed that 2-DG significantly elevated the volume, the titratable acid concentration and output, and the pepsin output. This stimulatory effect was abolished by the hypothalamic lesions. To eliminate the factors of age and weight, hypothalamic lesions were also created in a second group of 15 rats without previous basal and 2-DG-induced gastric secretory measurements. No significant elevation in any of the measured gastric secretory parameters was observed after 2-DG stimulation. All hyperphagic rats demonstrated hypersecretion of acid and pepsin. These results indicate that the ventromedial hypothalamic nuclei function either as centers or pathways in the mechanism by which an alteration in glucose metabolism within the CNS leads to augmented vagal activity.

1882 **GASTRIC ACID SECRETION, ABO (H) BLOOD GROUPS, AND SALIVARY SECRETOR STATUS.** *(Fr.)* Martin, S. (Edouard Herriot Hosp., Lyon, France), J. P. Léonard, A. Jouvenceaux and R. Lambert. *Arch Franc Mal Appar Dig* 58(3):139-148, 1968.

Betazole-stimulated gastric acid secretion and blood groups were studied in 100 male patients with duodenal ulcers and 100 age-matched male controls with other diseases. Each group included 37 North African Muslims. In addition, the blood group secretor status was determined on 57 ulcer patients and 51 controls. More ulcer patients than controls had the 0 blood group, but the χ^2-test showed this difference was not significant. Acid secretion was significantly higher among ulcer patients than among controls. There was no significant difference between acid secretion in North African Muslims and the rest of the population of these 2 groups. Acid secretion in ulcer patients with blood group 0 was significantly higher than in those with group A or all of those with groups A, B, and AB. More ulcer patients than controls were nonsecretors, but the difference was not significant. There was also no significant difference in acid secretion between blood group secretors and nonsecretors. The incidence of duodenal ulcers was significantly higher among patients with group C and nonsecretors with other blood groups than among secretors with blood groups A, B, and AB.

1883 **THE EFFECT OF ALDOSTERONE ON HUMAN GASTRIC SECRETION.** *(It.)* Ferlito, S. (Inst. Spec. Med. Path., U. Catania, Italy) and F. Romano. *Riv Gastroent* 20(2):86-96, 1968.

Gastric secretion was studied in 15 men, aged 28-59 yr, with no clinical or radiological signs of stomach disease. Determinations were made before and after i.m. administration of 500 μg of synthetic d-aldosterone. Subjects included 3 with hypochlorhydria, 9 with normochlorhydria, and 3 with hyperchlorhydria. In subjects with hyperchlorhydria and 6 of those with normochlorhydria aldosterone produced a small but significant increase in pepsin activity and acid secretion. In most of these subjects the maximum increase occurred 60 min after administration of aldosterone. K secretion increased slightly and Na secretion decreased significantly. The latter change is attributed to Na retention produced by aldosterone. Little or no change in gastric secretion occurred in the remaining 3 subjects with normochlorhydria or those with hypochlorhydria.

1884 **SHORT-TERM STUDY OF THE EFFECT OF HUMAN PARIETAL CELL ANTIBODY ON THE SECRETION OF HYDROCHLORIC ACID IN RATS.** *(E.)* Fiasse, R. (New York Med. Coll., N. Y.), I. Brus, C. F. Code and G. B. J. Glass. *Gut* 10(1):39-44, 1969.

The inhibitory effect on gastric secretion of immunoglobulin G (IgG) fractions of sera from 21 patients (12 had atrophic gastritis and 4 of these also had pernicious anemia) was tested in rats with pyloric ligation at dosages of 0.010-5.0 mg i.v. Ten of the patients had parietal-cell antibodies and 4 of these also had intrinsic-factor antibodies in their sera. The IgG fraction of one of these sera had a slight inhibitory effect on gastric secretion in the rat at a dose of 1.0 mg. A similar effect was obtained when 5.0 mg of IgG from a pool of these sera was injected as a single dose. The IgG fraction of the 9 remaining sera with parietal-cell antibodies had no significant effect on gastric secretion. None of the IgG fractions derived from the 4 sera containing intrinsic-factor antibodies inhibited gastric secretion in the rats. Since the gastric secretory activity was termined 5 hr after injection of the antibodies, the possibility long-term effects of prolonged exposure of parietal cells to rculating parietal cell antibodies could not be ruled out.

885 **GASTRIC RESPONSE TO SECRETIN AND PANCREOZYMIN IN MAN.** *(E.)* Wormsley, . G. (Roy. Infirm., Sheffield, England). *Scand J Gastroent* (6):632-636, 1968.

ormonal influences on gastric secretion were studied in 10 ealthy subjects, in 25 patients with chronic duodenal ulcer nd in 4 patients with chronic pancreatitis. Secretin, given by ontinuous i.v. infusion at various dosages, inhibited basal astric acid secretion in 50% of the subjects studied and failed o influence basal acid output in the remainder. Secretion stimlated the secretion of pepsin. Pancreozymin stimulated cid and pepsin secretion in about two-thirds of the subjects, ut the gastric stimulatory effect was considerably less powerul than pentagastrin. It is noted that the overall effect of the uodenal hormones on the human stomach is stimulatory, raher than inhibitory, in contrast to impressions gained from tudies in animals.

1886 **EFFECT OF ANTRECTOMY ON GASTRIC HISTIDINE DECARBOXYLASE ACTIVITY IN THE RAT.** *(E.)* Johnson, L. R. (Res. VA Ctr., Los Angeles, Calif.), R. S. Jones, D. Aures and R. Hakanson. *Amer J Physiol* 216(5):1051-1053, 1969.

The histidine decarboxylase activity of the oxyntic gland area of antrectomized rats was compared to that in sham-operated control animals. All animals were fasted for 48 hr and then divided into three groups, each containing equal numbers of antrectomized and sham-operated rats. Nothing further was done to the first group; the second was killed 1 hr after an injection of 250 μg/kg pentagastrin; the third was killed after being allowed to eat freely for 2 hr. There was no enzyme activity in the mucosa from any of the fasted antrectomized animals, whereas all the controls had significant activity. Pentagastrin caused approximately a 10-fold increase in enzyme activity of both antrectomized and sham-operated animals. Feeding increased histidine decarboxylase activity approximately 15-fold in sham-operated animals, but only 5-fold in antrectomized. This indicates that endogenous gastrin is necessary for interprandial histamine formation and for much of the increase in enzyme activity stimulated by feeding. Since both endogenous and exogenous gastrin can regulate enzyme activity, we conclude that in the rat the regulation of gastric mucosal histamine formation is a physiological function of gastrin.

1887 **EFFECTS OF FAT, SECRETIN, AND CHOLECYSTOKININ ON HISTAMINE-STIMULATED GASTRIC SECRETION.** *(E.)* Johnson, L. R. (UCLA Sch. Med., Los Angeles, Calif.) and M. I. Grossman. *Amer J Physiol* 216(5):1176-1179, 1969.

The inhibitory effects of the intraduodenal infusion of fat and the i.v. infusion of secretin and cholecystokinin on histamine-stimulated gastric secretion were compared in dogs with Heidenhain pouches, gastric and duodenal fistulas. With the gastric fistula open, a constant level of secretion was established in the Heidenhain pouch with a dose of 0.04 mg/kg/hr of histamine. 2 HCl. Then either fat was instilled in the duodenum or secretin and/or cholecystokinin (2 or 4 U/kg/hr) were infused intravenously. Fat produced a prompt inhibition of gastric secretion which reached more than 50% after 45 min. This effect could not be mimicked by physiological doses of pure forms of secretin and cholecystokinin. We conclude that this is evidence that fat in the duodenum causes the release of an enterogastrone distinct from the two biochemically identified duodenal hormones.

1888 **ACTION OF HISTALOG ON THE SECRETION OF SULFATED GLYCOPROTEINS IN THE HUMAN STOMACH.** *(E.)* Bernard, A. (Hosp. Ed. Herriot, Lyon, France), F. Martin, C. Andre and R. Lambert. *Scand J Gastroent* 4(1):97-101, 1969.

A technique of selective precipitation of sulfated glycoproteins by cetylpyridinium chloride was applied to the titration of the sulfated glycoproteins in the human gastric secretion, prior to and after injection of Histalog. The analysis was performed on 2 subjects: 2 samples were collected before the administration of the stimulant, 4 others after. The output of sulfated glycoproteins was not significantly modified by the administration of Histalog. The concentration of the sulfated glycoproteins decreased in a significant way owing to the increase of the volume of the samples. There was a negative correlation between the acid concentration and the concentration of the sulfated glycoproteins in the human gastric juice.

1889 **TWO MODELS OF GASTRIC H, Na, K, AND Cl SECRETION IN THE DOG USING HISTAMINE AND PENTAGASTRIN.** *(E.)* Hutchinson, G. A. (U. Alabama Med. Coll., Birmingham) and B. I. Hirschowitz. *Amer J Physiol* 216(3):487-492, 1969.

Two current models for the dose-responsive gastric secretion of water, H^+, Cl^-, Na^+, and K^+ were compared in four conscious gastric-fistula dogs. Histamine and pentagastrin were used as stimulants, with each of eight doses of histamine (4-125 μg/kg/hr) and seven doses of pentagastrin (0.1-6.0 μg/kg/hr) given by a 4-hr i.v. infusion to each dog at a different time. The models used are defined by the equations : $V(z) = (Az + B)/(Cz + D)$ and $V(z) = \alpha + \beta e^{-\gamma z}$, resp., where z is the infused dose and $V(z)$ the measured output. No significant difference could be exhibited between these models although the first gives better estimates of maximum secretory capacity than the second. As measured by the amount secreted, histamine proved to be the more effective stimulant. However, pentagastrin reached maximum efficiency earlier than histamine, and was effective at approximately 125 times smaller molar concentrations.

1890 **POTENTIATION OF ACID SECRETION IN DOGS.** *(E.)* Cooke, A. R. (UCLA Sch. Med., Los Angeles, Calif.). *Amer J Physiol* 216(4):968-973, 1969.

In dogs with a simple gastric fistula, tests were made to compare acid and pepsin outputs stimulated by histamine, hog gastrin, or bethanechol alone or in various combinations. It was found that each substance used in combination with one other produced a higher maximal acid output than if the substance was given alone. Maximal pepsin output was not potentiated by combinations of the three agents. In other studies using 2-deoxy-D-glucose in combination with histamine or hog gastrin potentiation of acid output was not demonstrated. In another group of dogs with an extrinsically denervated antral pouch, a gastric fistula, and a Heidenhain pouch, maximal acid output from the gastric fistula in response to histamine was potentiated by endogenous gastrin released by antral perfusion. Potentiation of acid output did not occur for the Heidenhain pouch under these experimental conditions. In these studies it was found that acid output from a gastric fistula in response to histamine or hog gastrin was potentiated by exogenous (bethanechol) cholinergic stimulation and that potentiation of acid output was found when histamine was combined with exogenous or endogenous gastrin.

1891 **METABOLIC PATHWAY OF HISTAMINE IN CANINE GASTRIC MUCOSA IN RELATION TO ACID SECRETION.** *(E.)* Dombro, R. (Albert Einstein Coll. Med., Yeshiva U., Bronx, N. Y.), M. Huang, M. Dittbrenner and H. Ragins. *Amer J Physiol* 216(4):988-994, 1969.

To elucidate the mechanism by which histamine stimulates gastric secretion and to investigate its failure to be blocked by antihistamines, the metabolites of exogenous histamine-^{14}C were studied simultaneously in gastric corpus and antrum, rectum, and blood during and after the secretory response. The radioactivity was found almost entirely in three metabolites: methylhistamine, imidazoleacetic acid, and methylimidazoleacetic acid, none of which stimulates acid secretion. At the peak of secretion, only traces of unmetabolized histamine-^{14}C could be found in the gastric mucosa. The ratios of the three metabolites in the corpus mucosa were similar at the peak to those at cessation of secretion. In addition, the ratios of radioactive metabolites in the parietal cell-containing corpus mucosa did not differ from those in the antral mucosa, although they differed significantly from those found in the rectal mucosa and blood. *In vitro* studies of histamine-^{14}C metabolism in mucosal homogenates of corpus, antrum, and rectum showed that methylation is the exclusive metabolic pathway in the stomach, whereas oxidation appears to be the favored pathway in the rectum.

1892 **THE EFFECT OF *l*-HYOSCYAMINE ON GASTRIC SECRETION OF ACID AND PEPSIN IN MAN.** *(E.)* Walan, A. (Sahlgren's Hosp., Göteborg, Sweden). *Scand J Gastroent* 4(2):157-167, 1969.

After collecting basal secretion for 30 min a histamine infusion 2.1-35.4 μg/kg body weight was started. The infusion speed was increased every 15 min. The histamine infusion lasted 1½ hr. During histamine stimulation there was a continuous increase in volume, acid concentration, acid output, and pepsin output for every period. Treatment with *l*-hyoscyamine (0.4-1.0 mg), which prior to the second investigation had been given for at least 2½ weeks, resulted in a lowered volume, acid concentration, and acid output, during all periods of histamine stimulation. The pepsin concentration was also slightly lower for every period during treatment, resulting in a marked decrease in pepsin output.

1893 **SUCCINIC DEHYDROGENASE ACTIVITY IN THE GASTRIC MUCOSA OF RATS DURING HYPERTHERMIA.** *(E.)* Semb, L. S. (Ullevål Hosp., Oslo, Norway), J. Myren and O. B. Reite. *Scand J Gastroent* 4(2): 213-215, 1969.

The activity of succinic dehydrogenase (SDH) was examined in the gastric mucosa of 11 rats with normal body temperature (controls) and 11 rats with a body temperature maintained at 41-42C for one hr in a thermostat. The pH of the mucosal surface of the glandular stomach was determined. The hyperthermic rats had an enlarged and congested gastrointestinal tract with a pH above 5 in the gastric content, whereas the stomachs of the controls were small and contracted with pH 1-2. No reduction was found in SDH activity of parietal cells that could account for the reduced hydrochloric acid secretion in hyperthermic animals.

1894 **CONTINUOUS INTRAVENOUS PENTAGASTRIN AS A STIMULANT OF MAXIMAL GASTRIC ACID SECRETION.** *(E.)* Mason, M. C. (Gen. Infirm., Leeds, England), G. R. Giles and C. G. Clark. *Gut* 10(1):34-38, 1969.

The effect of pentagastrin (0.6, 1.2, 3.0 and 6.0 μg/kg/hr i.v.) has been studied in 15 male patients before surgery for duodenal ulceration, and in another similar group of 10 male patients (3.0, 6.0 and 12.0 μg/kg/hr pentagastrin i.v.) several months after complete vagotomy and drainage, to determine the dose required to elicit maximal gastric acid secretion in each instance. In the preoperative patients, a dose of 1.2 μg/kg/hr was found to be adequate but, after a complete surgical vagotomy, it was necessary to increase the dose to 6.0 μg/kg/hr to obtain the maximum output. At these levels, the responses obtained compared favorably with those obtained from a standard histamine infusion test.

1895 **INFLUENCE OF DIETARY FAT ON HISTAMINE STIMULATED GASTRIC SECRETION IN RATS.** *(E.)* Kowalewski, K. (Surg.-Med. Res. Inst., U. Alberta, Edmonton, Canada). *Digestion* 2(1):1-6, 1969.

Gastric secretory function was studied for 24 hr in 83 female Wistar rats bearing permanent gastric fistulas and permanent i.v. cannulas. Rats were fed normal (36 rats), fat free (22 rats), and rich fat (25 rats) diets for three months prior to collection of gastric content. Saline or histamine in saline were infused i.v. for 24 hr during the collection period. Feeding fat rich diet induced the significant depression of histamine (100 mg/kg/24 hr i.v.) stimulated gastric secretion. The absence of normal post-histaminic increase of gastric secretory function in rats fed a fat-rich diet is considered due to "work hypoplasia", resulting from prolonged and repeated inhibition of secretory function of parietal cells.

1896 **PENTAGASTRIN IN THE GASTRIC FISTULA DOG.** *(E.)* Hirschowitz, B. I. (VA Hosp., Birmingham, Ala.) and G. Sachs. *Gastroenterology* 56(3):456-467, 1969.

The stimulation of secretion of water, H^+, pepsin, and electrolytes from the innervated stomach was studied in 6 fistula dogs. Each of eight doses of pentagastrin (0.1 to 12.0 μg/kg/hr) was given by a separate 4-hr infusion. Both peak and total output of each component could be related to dose in a linear model ($S/V = aS + b$, where S = dose and V = output) conforming to isotherm kinetics. By this model, the S_{50} dose of pentagastrin for water secretion in this experiment was 0.35 μg/kg/hr, for a

ep fade of output of water and electrolytes at all doses by
to 70% of peak at 240 min which could not be reversed
KCl injection as was the case with fade in histamine stim-
ation. Calculation of changes in body fluid composition
owed no significant differences in Na^+, K^+, and Cl^- shifts
m that seen for comparable histamine-stimulated gastric
ce loss. Although electrolyte secretion is apparently stimu-
ed in a manner similar to that due to histamine, pentagastrin
mulates pepsin much more, is sensitive to atropine inhibition,
d apparently is unresponsive to KCl injection. These differ-
ces show that pentagastrin cannot be exerting all of its effects
rough the intermediation of histamine.

97 **EFFECT OF SECRETIN ON ACID AND PEPSIN SECRETION IN CAT AND DOG.** *(E.)* Stening,
F. (U. California Sch. Med., Los Angeles), L. R. Johnson
d M. I. Grossman. *Gastroenterology* 56(3):468-475, 1969.

cretin in doses which produced a maximal inhibition of
stric secretion in the dog and maximal stimulation of pancre-
ic secretion in the cat had no effect on gastrin-stimulated
stric secretion in the cat. Irrigation of the duodenum with
id produced a much smaller inhibition of gastrin-stimulated
stric secretion in the cat than in the dog, thus suggesting that
dogenous secretin is not so important for the control of
id secretion in the cat as in the dog. It was concluded that
e disparity between the action of secretin on gastric secre-
on in the cat and dog represents a true species difference.
lentical doses (on a body weight basis) of secretin, however,
roduced strong stimulation of pepsin secretion in both the
at and dog. Stimulation was produced by continuous i.v. in-
usions of secretin in doses submaximal for pancreatic secre-
ion. In addition the effect of natural secretin was reproduced
xactly by the synthetic hormone, indicating that the stimula-
ion of pepsin secretion is a property of the secretin molecule.
Endogenous secretin, released by either exogenous acid in the
luodenum or by closing the gastric fistula, reproduced the ef-
fect of the exogenous secretin or pepsin secretion. It is con-
cluded that the stimulation of pepsin secretion is a physiologi-
cal action of secretin.

898 **ELECTROLYTE MOVEMENT ACROSS CANINE ANTRAL AND FUNDIC GASTRIC MUCOSA.**
E.) Dyck, W. P. (Mount Sinai Sch. Med., New York, N. Y.),
I. L. Werther, J. Rudnick and H. D. Janowitz. *Gastroenterology*
56(3):488-495, 1969.

Isosmotic HCl solutions containing a nonabsorbable dilution indicator were instilled into vagally denervated canine antral and fundic pouches to study the comparative rates of electrolyte flux across the gastric surface epithelium from these two areas. Similar changes occurred in both pouches but hydrogen loss, sodium gain, and fluid entry were two to three times greater in the antrum; potassium entry was 10 to 12 times greater. Measurement of surface area of two antral, one "mixed," and one fundic pouch suggest an even greater difference between the relative rates of electrolyte movement across these two types of gastric surface epithelium. Neither a cationic exchange of hydrogen for sodium nor dilution and neutralization by entering bicarbonate can alone account for the hydrogen ion loss. A combination of mechanisms, some as yet unknown, appears more likely. This increased antral permeability may be related to the physiological inhibition of gastrin release and the increased susceptibility of the antral mucosa to acid-peptic ulceration. The present data suggest that a significant portion of potassium appearing in gastric juice collected from the whole stomach enters through some component of the gastric mucosa other than parietal cells.

1899 **BASAL AND ^{131}I-STIMULATED GASTRIC SECRETION IN DUODENAL ULCERS.** *(Fr.)* Szántay, I. (3rd Med. Clin., Cluj, Romania), S. Cotul, O. Fodor and S. Popesco. *Rev Roum Med Intern* 5(6):395-402, 1968.

1900 **INFLUENCE OF IPRONIAZID ON NOREPINEPHRINE CONTENT IN GASTRIC WALL TISSUE UNDER EXPERIMENTAL DYSTROPHY.** *(E.)* Zavodskaia, I. S. (Inst. Exp. Med., Leningrad, USSR) and O. N. Zabrodin. *Pharmacology* 1(6):375-379, 1968.

1901 **COMPARISON OF THE EFFECTS OF HUMAN AND PORCINE GASTRIN ON ISOLATED GASTRIC MUCOSA OF THE BULLFROG.** *(E.)* Davidson, W. D. (Harbor Gen. Hosp., Torrance, Calif.), O. Urushibara and J. C. Thompson. *Proc Soc Exp Biol Med* 130(1):204-206, 1969.

1902 **THE VAGAL INHIBITORY RESPONSES OF THE STOMACH TO STIMULATION OF THE DOG'S PONS AND MIDBRAIN.** *(E.)* Semba, T. (Hiroshima U. Sch. Med., Japan), K. Fujii, N. Kimura and S. Ohya. *Hiroshima J Med Sci* 17(2):93-103, 1968.

1903 **ACID SECRETION IN THE STOMACH AND CHANGES IN THE ACID-BASE EQUILIBRIUM IN BLOOD AFTER MAXIMUM STIMULATION WITH BETAZOL.** *(Ger.)* von Mikulicz-Radecki, J. (Med. Clin., U. Heidelberg, Germany) and H. Kaess. *Verh Deutsch Ges Inn Med* 74:585-588, 1968.

1904 **STUDIES OF GASTRIC ACID SECRETION AFTER ADMINISTRATION OF PENTAGASTRIN.** *(Ger.)* Gugler, R. (Med. Clin., U. Heidelberg, Germany), M. Eichelbaum and H. Kaess. *Verh Deutsch Ges Inn Med* 74:228-230, 1968.

1905 **THE REACTION OF THE GASTRIC GLANDS TO VARIOUS STIMULI.** *(Rus.)* Kapustnik, A. Ia. *Vop Pitan* 27(5):90-91, 1968.

See also 1861,1868,2031,2033,2055,2542

1906 **TRYPSIN INHIBITORS. III. THE MODIFICATION AND INHIBITORY BEHAVIOR OF A SPECIFIC TRYPSIN INHIBITOR FROM SWINE PANCREAS WHICH CATALYZES THE HYDROLYSIS OF TRYPSIN IN ACID.** *(Ger.)* Tschesche, H. (Dept. Org. Chem., Inst. Technol., Munich, Germany) and H. Klein. *Hoppe Seyler Z Physiol Chem* 349(12):1645-1656, 1968.

Inhibitor, obtained from swine pancreas homogenates by adsorption on water-insoluble trypsin colums, was separated into 3 components by ion-exchange chromatography. It was demonstrated that 2 of these components were formed by degradation of the original inhibitor. On incubating the original inhibitor with half the equivalent quantity of water-soluble trypsin at 37C for 24 hr it was found that inhibitor degradation occurred at all pH values but occurred most rapidly near pH 3.4. At this pH almost all of the original inhibitor was broken down after 24 hr, and the 2 degradation products, identical to those formed on ion-exchange columns, were broken down further after 6-8 hr into products with little inhibitory activity. Trypsin hydrolysis of the inhibitor occurred only below pH 5.5. At a pH of 3.75 trypsin itself was partially hydrolyzed into 2 fragments. The fragment with the smaller molecular weight was eluted together with inhibitor and was separated from it by electrophoresis. In order to obtain trypsin inhibitor with as little degradation as possible pancreas homogenates were adsorbed on water-insoluble trypsin columns at pH 6.0 instead of pH 7.8, inhibitor was eluted as rapidly as possible, the pancreas homogenates were deproteinized at pH 6.0 with alcohol rather than perchloric acid, and all operations were performed at 0C. Incubation of the original inhibitor and one of its degradation products with excess trypsin revealed that the degradation product was inactivated more rapidly under the physiological conditions present in the duodenum (pH 7.8 and 37C). The original inhibitor inhibited trypsin activity by 51% and the degradation product inhibited it by 87%.

1907 **Na-K-ACTIVATED ADENOSINE TRIPHOSPHATASE AND PANCREATIC SECRETION IN THE DOG.** *(E.)* Ridderstap, A. S. (Dept. Biochem., U. Nijmegen, Netherlands) and S. L. Bonting. *Amer J Physiol* 216(3):547-553, 1969.

Mongrel dogs of both sexes were used to study the occurrence of a ouabain-sensitive, Na^+-K^+-activated, adenosine triphosphatase system in pancreas homogenates, as well as the effect of ouabain on pancreatic secretion. The properties of this enzyme system that were determined included its activation by sodium, potassium and magnesium, the pH and temperature optima, and the ouabain inhibition curve. Pancreatic secretion in the dog *in vivo*, stimulated by continuous perfusion with secretin at a rate of 0.5 U/min, was inhibited by ouabain injected into the arterial blood supply of the organ. A maximal average inhibition of 70% was found after administration of 45 μg ouabain/kg body weight. The sodium and bicarbonate concentrations in the pancreatic fluid remained unchanged. Potassium and chloride concentrations, however, tended to increase transiently after ouabain injection.

1908 **INFLUENCE OF GLUCAGON ON PANCREATIC EXOCRINE SECRETION.** *(E.)* Dyck, W. P. (Mount Sinai Sch. Med., N. Y.), J. Rudnick, B. Hoexter and H. D. Janowitz. *Gastroenterology* 56(3):531-537, 1969.

Effects of small amounts of glucagon on pancreatic exocrine function were studied in 7 pancreatic fistula dogs in a) the resting state, b) during continuous intravenous infusion of secretin, and c) during infusion of secretin with pancreozymin. Glucagon produced no significant stimulation of secretion in the resting gland but markedly depressed volume flow and enzyme concentrations in the stimulated gland. Inhibition of enzyme output was greater than was inhibition of volume and bicarbonate output.

1909 **SELECTIVE EFFECTS OF DIETARY EGG WHITE TRYPSIN INHIBITOR ON PANCREATIC ENZYME SECRETION.** *(E.)* Rothman, S. S. (Dept. Physiol. Clin. Dent., Harvard Med. Sch., Boston, Mass.) and H. Wells. *Amer J Physiol* 216(3):504-507, 1969.

These experiments examined the effects of dietary trypsin inhibitor on the enzyme content of pancreatic tissue and the output of three enzymes in secretion. Egg white trypsin inhibitor was added to the regular diet of rats for 6 days. The experimental diet, although not affecting body weight, increase pancreas weight by 35%. Tissue content of chymotrypsinogen and amylase were markedly elevated whereas trypsinogen was not. Unstimulated pancreatic secretion, however, contained increased amounts of trypsinogen but chymotrypsinogen and amylase outputs were unaltered by treatment. In control-diet rats, methacholine nonselectively augmented the output of all three enzymes. In rats fed egg white trypsin inhibitor, the enhancement of trypsinogen output after methacholine was much greater than that of control rats, while chymotrypsinogen output was augmented to a lesser degree and amylase output was unaffected. These results suggest that the specific digestive needs of the organism may influence not only the synthesis of digestive enzymes but the capacity of acinar cells to transport these enzymes.

1910 **SECRETORY STIMULATION OF THE RAT PANCREAS BY p-AMINOBENZAMIDINE.** *(E.)* Geratz, J. D. (U. North Carolina Sch. Med., Chapel Hill). *Amer J Physiol* 216(4):812-817, 1969.

The release of pancreatic enzymes by the trypsin inhibitor p-aminobenzamidine was studied in starved, nonanesthetized rats who received the compound through an intragastric tube. The effect of the inhibitor was determined by measuring intestinal and pancreatic enzyme levels. As little as 0.27 mg free inhibitor base/100 g body wt of rat produced a significant secretory response. It was not necessary to provide "background" stimulation by secretin or foodstuffs to obtain an effect. At high doses of p-aminobenzamidine, breakdown of the enzymes secreted into the intestine was greatly accelerated. Bactoprotone and L-phenylalanine neither induced enzyme output nor augmented the response to suboptimal doses of p-aminobenzamidine. 4,4'-Diamidinodiphenylamine and p-amidinophenylpyruvic acid, two compounds out of a series of trypsin inhibitors structurally related to p-aminobenzamidine, were as potent secretagogues as p-aminobenzamidine. There was no strict parallelism between pancreas-stimulating activity and trypsin-inhibitory strength.

1911 **EFFECT OF VAGOTOMY OR ATROPINE ON THE CANINE PANCREATIC RESPONSE TO SECRETIN AND PANCREOZYMIN.** *(E.)* Henriksen, F. W. (Inst. Exp. Res. Surg., U. Copenhagen, Denmark). *Scand J Gastroent* 4(2):137-144, 1969.

In 7 dogs with chronic, duodenal Thomas fistulas and gastrostomies, vagotomy had no effect on the basal pancreatic secretion, and also failed to change the response to exogenous hormonal stimulation. Atropine (0.1 mg/kg body weight) had a pronounced depressing effect on the basal secretion of fluid. Also the protein secretion in response to secretin (1 U/kg body weight) was reduced. The secretion of fluid and bicarbonate in response to isolated stimulation with pancreozymin (1 U/kg body weight) increased after atropine, whereas the secretin-stimulated secretion remained unchanged. The findings indicate the existence of local cholinergic mechanisms.

1912 **VARIABILITY OF THE SUM OF BICARBONATE AND CHLORIDE CONCENTRATIONS IN THE PANCREATIC JUICE OF THE DOG.** *(E.)* Pascal, J. P. (Purpan Hosp., Tuoulouse, France), N. Vaysse, A. Louis, D. Augier and A. Ribet. *Scand J Gastroent* 4(2):177-184, 1969.

A study of the electrolyte content of pancreatic juice in 20 anesthetized dogs showed that the sum of bicarbonate and chloride and the sum of bicabonate, chloride, sodium and potassium concentrations were variable in the course of a single experiment in most animals. The only factor of variation was bicarbonate concentration. These facts are compatible with the ‘admixture theory’. On the condition that some postulations are made, it becomes possible to calculate the composition of the components of the juice, on the basis of a two-component hypothesis. Comparison between our results and those of others in the gastric juice suggests that the neutral components of gastric and pancreatic juices are secreted through similar processes.

1913 **CHOLINERGIC EFFECT ON THE CANINE PANCREATIC RESPONSE TO ACIDIFICATION OF THE DUODENUM.** *(E.)* Henriksen, F. W. (Inst. Exp. Res. Surg., U. Copenhagen, Denmark) and S. J. Rune. *Scand J Gastroent* 4(2):203-208, 1969.

On acidification of the duodenum in 3 conscious dogs with duodenal Thomas fistulas and gastrostomies no change in pancreatic secretion was observed after vagotomy. Cholinergic stimulation (Urecholine diluted in saline, 1 mg/hr i.v.) significantly increased the pancreatic secretion of fluid and bicarbonate in response to 0.1 N hydrochloric acid (4.0 mEq in 30 min) in the duodenum. The ratio between the pancreatic secretion of bicarbonate and the amount of acid introduced into the duodenum to elicit that response was 1:3.2. Urecholine stimulation increased the ratio to 1:1.7.

1914 **PANCREATIC AMYLASE ACTIVITY FROM RUMINANTS FED DIFFERENT RATIONS.** *(E.)* Clary, J. J. (U. Kentucky, Lexington), G. E. Mitchell Jr., C. O. Little and N. W. Bradley. *Canad J Physiol Pharmacol* 47(2):161-164, 1969.

1915 **PANCREATIC EXCRETION OF ERYTHROMYCIN: COMPARISON OF RESULTS OBTAINED VIA A THOMAS CANNULA AND A DUODENOPANCREATICOPYELOSTOMA IN DODGS.** *(E.)* Wyman, J. B. (Mayo Clin., Rochester, Minn.), J. S. Aldrete, L. G. Batholomew, A. G. Karlson, K. G. Wakim and J. C. Cain. *Arch Surg* 98(3):381-383, 1969.

1916 **INTRACELLULAR DISTRIBUTION OF LIPOLYTIC ENZYMES IN THE RAT PANCREAS.** *(E.)* Arnesjö, B. (Chem. Ctr., U. Lund, Sweden) and H. Filipek-Wender. *Acta Physiol Scand* 74(4):616-628, 1968.

1917 **SPECIES DIFFERENCES IN THE ACCUMULATION OF 4-IODOPHENYLALANINE IN THE EXOCRINE PANCREAS.** *(E.)* Blomquist, L. (Dept. Pharmacol., Royal Veterinary Coll., Stockholm, Sweden). *Comp Biochem Physiol* 28(2):777-782, 1969.

1918 **STUDIES OF EXOCRINE AND ENDOCRINE PANCREATIC FUNCTION AFTER EXOGENOUS AND ENDOGENOUS STIMULATION WITH SECRETIN AND PENTAGASTRIN.** *(Ger.)* Kaess, H. (Med. Clin., U. Heidelberg, Germany) and G. Schlierf. *Verh Deutsch Ges Inn Med* 74:225-227, 1968.

1919 **EFFECT OF PANCREOZYMIN ON THE CANINE PANCREATIC SECRETION OF FLUID AND BICARBONATE.** *(E.)* Henriksen, F. W. (Inst. Exp. Res. Surg., U. Copenhagen, Denmark). *Scand J Gastroent* 3(6):637-640, 1968.

1920 **THE REGENERATIVE POWER OF THE RETICULO-ENDOTHELIAL AND PARENCHYMAL CELLS OF THE LIVER FOLLOWING PARTIAL HEPATECTOMY IN DOGS.** *(E.)* Aronsen, K. F. (Gen. Hosp., Malmö, Sweden), H. Grundsell, G. Nylander and B. Waldeskog. *Acta Chir Scand* 135(2):171-175, 1969.

In 14 dogs, the regenerative power of the reticuloendothelial and parenchymal cells of the liver after partial hepatectomy was studied by means of liver scanning (colloidal radiogold and ^{131}I-labeled Rose Bengal, resp.). No difference in the regenerative power of the two liver cell systems could be demonstrated. Almost complete restitution of liver size occurred 8-12 weeks after operation. After hepatectomy, the regenerating liver tissue increased in size as a whole mass, no outgrowth from the resection surface being seen. Observations in 2 of the 14 puppies demonstrated the possibility of a growth factor which potentiates liver regeneration above rates normally observed in adult animals. Some of the mechanisms which may regulate hepatic regeneration are discussed.

1921 **ALCOHOLIC STEATOSIS OF THE LIVER. I. IMMEDIATE EFFECTS OF ALCOHOL, FRUCTOSE, AND A COMBINATION OF ALCOHOL AND FRUCTOSE ON THE CONCENTRATIONS OF L-α-GLYCEROPHOSPHATE AND NICOTINAMIDE ADENINE DINUCLEOTIDES IN RAT LIVER.** *(Fr.)* Hakim, J. (Beaujon Hosp. Clichy, France), A. Cornillot-Clément, P. Boivin and R. Fauvert. *Path Biol (Paris)* 17(1/2):59-69, 1969.

Wistar rats, anesthetized with 0.3 ml/100 g of a 1% thiopental sodium solution i.p., were given i.v. infusions of 9% NaCl, 20% fructose, 10% alcohol, or a combination of 20% fructose and 10% alcohol. Fructose alone produced large increases in plasma glucose, lactate, and pyruvate levels but had little effect on liver α-glycerophosphate concentrations or the ratio of reduced to oxidized nicotinamide adenine dinucleotides in the liver. The combination of fructose and alcohol had less effect on plasma glucose, lactate, and pyruvate levels but produced a large increase in liver α-glycerophosphate and reduced nicotinamide adenine dinucleotide concentrations. Administration of alcohol alone produced effects intermediate between those obtained with fructose or the combination of fructose and alcohol. These results are probably due to an abnormal metabolic pathway in the presence of alcohol since dihydroxyacetone phosphate, 3-phosphoglyceraldehyde, and glyceraldehyde were partially reduced instead of being oxidized as under normal conditions. The large increase in the ratio of reduced/oxidized nicotinamide adenine dinucleotides observed during infusion of fructose and alcohol seems to occur in the mitochondria due to increases in α-glycerophosphate concentrations. These increases in liver α-glycerophosphate concentrations are believed to be an important factor in the etiology of alcoholic steatosis.

1922 **FATTY ACID PATTERN OF THE HUMAN BILE.** *(E.)* Berg, G. (Med. Dept., U. Nuremberg-Erlangen, Germany) and U. Troll. *Digestion* 1(6):337-340, 1968.

Human bile from normal subjects and patients with hepatitis was analyzed by gas chromatography in order to determine its fatty acid composition in relation to the contents of the small intestine during the digestive process. Results obtained in the normal subjects showed that the neutral fat fraction contained about 27% saturated fatty acids, 23% monoene fatty acids, and 50% polyene fatty acids. Palmitic acid, oleic acid, and linoleic acid were the most prevalent. The phosphatide fraction contained about 27% saturated fatty acids, 9% monoene fatty acids, and 34% polyene fatty acids. In patients with hepatitis the most significant finding was a decrease in the polyene fatty acids. This decrease was encountered in the liver itself as well as in the bile.

1923 **TESTOSTERONE METABOLISM IN THE ISOLATED PERFUSED HUMAN FOETAL LIVER.** *(E.)* Demisch, K. (Inst. Physiol. Chem., U. Dusseldorf, Germany), U. Ammedick and W. Staib. *Europ J Biochem* 8(2):284-286, 1969.

When the isolated liver (5.65 g) of a previable female fetus (18 weeks of gestation) was perfused with (4-^{14}C) testosterone 45 min after clinical death (during which time the liver was kept in a physiological solution), 75.2% of the radioactivity could be extracted from the perfusion medium by organic solvents, only 0.66% remained in the aqueous phase, and 0.45% remained in the liver, indicating that little steroid conjugation took place. No measurable amounts of estrone, estradiol, or estriol could be isolated; however, 6β-hydroxy-androstenedione, 6β-hydroxy-androstenedione, 2β-hydroxy-testosterone and androstenedione were isolated, and the diacetate of 2β-hydroxy-testosterone was crystallized to constant specific activity.

1924 **LIVER GLYCOLYSIS AND ITS REGULATION BY CELLULAR COMPONENTS DURING SUBACUTE AND LONG-TERM ADMINISTRATION OF DDT TO WARM-BLOODED ANIMALS.** *(Rus.)* Iakushko, V. E. (All-Union Sci.-Res. Inst. Hyg. Toxicol. Pesticides Polymers Plastics, Kiev, USSR). *Farmakol Toksik* 32(1):107-110, 1969.

White male rats were given 70 mg/kg of DDT for 3 days or 3.5 mg/kg/day for 20 weeks p.o. When incubated with glucose, liver homogenates from animals given subacute doses produced 106% more lactic acid than those from the controls. The cytoplasm increased glycolysis by 54%. Addition of "secretion" from the mitochondrial fraction increased glycolysis by the cytoplasm by 47% or 54%, depending upon whether the medium was deficient in cofactors or not. When mitochondrial "secretion" from liver homogenates of rats given DDT for long periods was added to the cytoplasm, glycolysis was reduced 43% and 53%, resp. These findings indicate that subacute doses of DDT increase the rate of glycolysis by activating kinases, and long-term administration of DDT reduces the rate by glycolysis by inhibiting kinases.

1925 **ALCOHOLIC STEATOSIS OF THE LIVER. II. STUDY OF METABOLIC EFFECTS OF PERFUSION WITH FRUCTOSE ALONE OR WITH ALCOHOL IN THE NORMAL MAN.** *(Fr.)* Hakim, J. (Beaujon Hosp., Clichy, France), A. Cornillot-Clément, F. Nicolo, P. Boivin and R. Fauvert. *Path Biol (Paris)* 17(3/4):147-153, 1969.

lasma glucose, fructose, alcohol, lactate, and pyruvate were etermined on arterial blood from 10 patients with no evidence f liver disease before and 30, 45, and 60 min after beginning v. perfusions of 20% fructose or 20% fructose containing 20% thanol. Five of these patients were chronic alcoholics who ere studied after regression of alcoholic steatosis and absti- ence from alcohol. Perfusion of fructose alone produced sig- ificant increases in plasma glucose, lactate, and pyruvate evels. Perfusion of fructose containing alcohol caused sig- ificant increases in glucose and lactate levels and a significant ecrease in pyruvate levels. The combination of fructose and lcohol produced significantly higher blood glucose levels than ructose alone. These findings and the results of similar experi- ients on rats suggest that the effects produced by fructose and lcohol are due to increases in L-α-glycerophosphate in the liver hich is probably responsible, at least in part, for alcoholic teatosis.

926 **EXPERIMENTAL INDUCTION OF HELICAL POLYSOMES IN ADULT RAT LIVER.** *(E.)* lonneron, A. (Inst. Sci. Res. Cancer, Villejuif, France). *Lab nvest* 20(2):178-183, 1969.

lelical polysomes were found in the cytoplasm of liver cells f male Wistar rats (58 intact and 14 after partial hepatectomy) vithin 10 min after an injection of lasiocarpine (80 mg/kg i.p.). Similar results were obtained in another group of rats (53 intact nd 12 after partial hepatectomy) given an injection of aflatoxin 250 μg/kg i.p.). Within a few hr, the polysomes had disap- beared. The constituent ribosomes were arranged in helices which ranged up to 440 A in diameter and up to 1 μ in length. Some of the helices seemed to be attached to the endoplasmic reticulum while many were close to the nuclear membrane. Previous administration of actinomycin D at a dose that in- hibited the synthesis of nucleolar RNA did not prevent the oc- currence of the helices. The sudden and early occurrence of helical polysomes induced by lasiocarpine or aflatoxin is prob- ably related to the production of a special type of transient messenger RNA.

1927 **EFFECT OF GLUCAGON ON PHOSPHORYLASE ACTIVITY OF THE ISOLATED PERFUSED LIVER.** *(E.)* Weintraub, B. (Div. Med., Roswell Park Mem. Inst., Buffalo, N. Y.), E. J. Sarcione and J. E. Sokal. *Amer J Physiol* 216(3):521-526, 1969.

Exposure of the isolated perfused rat liver to concentrations of glucagon as low as 0.14 mμg/ml plasma results in measurable activation of phosphorylase. Maximal activation was observed at glucagon concentration of 1.4-4.0 mμg/ml. When glycogen-containing livers were used, the increases in phosphorylase activity were accompanied by increases in hepatic glucose release, and there was a quantitative correlation between these two effects over a 30-fold concentration range. Phosphorylase activation was detectable within 1 min of exposure of the liver to glucagon and was not blocked by puromycin. Both phosphorylase activity and hepatic glucose output were uniformly high at initiation of perfusion; this may be the result of secretion of glucagon during surgical preparation of liver donor rats. It is concluded that activation of phosphorylase is a very rapid and consistent result of glucagon action on the liver, that it can be observed at all concentrations of glucagon which cause glycogenolysis, and that it is not dependent on glycogenolysis or protein synthesis. The effects of glucagon were sufficiently reproducible in these experiments to recommend the isolated perfused rat liver as a semiquantitative bioassay system for glucagon.

1928 **HEPATIC AND PORTAL METABOLISM OF GLUCOSE, FREE FATTY ACIDS, AND KETONE BODIES IN THE SHEEP.** *(E.)* Katz, M. L. (New York State Veterinary Coll., Ithaca) and E. N. Bergman. *Amer J Physiol* 216(4):953-960, 1969.

Net production rates of several metabolites were estimated by measurement of blood concentration differences and the hepatic and portal blood flow. Four groups of sheep were used: nonpregnant fed; nonpregnant fasted; twin-pregnant fed; and twin-pregnant fasted (ketotic). An uptake of glucose by the portal bed was observed in all sheep. The mean net hepatic glucose production 3 hr after feeding was 0.28 and 0.43 g/hr·kg$^{3/4}$ (5.8 and 9.6 g/hr) in nonpregnant and pregnant sheep, resp.; when fasted 3 days the hepatic glucose production decreased to 0.13 and 0.19 g/hr·kg$^{3/4}$. There appeared to be a direct relationship between feeding, hepatic blood flow, and glucose production. Ketone bodies were produced mainly in the portal bed (0.6-0.8 mmole/hr·kg$^{3/4}$) of fed sheep, in which β-hydroxybutyrate predominated, but in fasted or ketotic sheep the liver was the main site of ketogenesis where acetoacetate formed 20-30% of the ketone bodies. Free fatty acids were taken up by the liver as a nearly constant proportion (10%) of the FFA transported to the liver. Hepatic ketone body production could have been the product of about 80% of this hepatic FFA uptake in ketotic sheep in contrast to only 0-30% of the FFA in nonketotic sheep. Thus a change in hepatic FFA metabolism, which produces more ketone bodies and less CO$_2$ and esterified products, may be a factor in the development of ketosis.

1929 **INTRINSIC REGULATION OF GLUCOSE OUTPUT BY RAT LIVER.** *(E.)* Glinsmann, W. H. (Natl. Inst. Child. Hlth., Bethesda, Md.), E. P. Hern and A. Lynch. *Amer J Physiol* 216(4):698-703, 1969.

The acute responses of isolated rat livers to hypo- and hyperglycemia were studied in a Mortimore-type perfusion system. Investigation of the effects of washed cell perfusates showed that elevation of red cell concentrations enhanced oxygen uptake, lowered perfusate equiplibration levels of glucose and lactate, reduced basal rates of glycogenolysis, and enhanced glucose utilization by nonglycogen pathways. Employing 36-38% red cell perfusates, livers from fed animals increased net glucose output and glycogenolysis following initial or delayed hypoglycemia and rapidly took up glucose with hyperglycemia. After 90 min of control perfusion, acutely induced hypoglycemia was followed by increases in perfusate glucose concentration with time, and final glucose equilibration levels were independent of perfusate volume. Net glycogen synthesis was obtained with sustained hyperglycemia and was increased proportionally to glucose concentration of the medium when livers from fasted animals were used. These findings support the hypothesis that mammalian liver can directly regulate glucose output and glycogen metabolism in response to circulating glucose concentration.

1930 **THE EFFECT OF METHOTREXATE ON ENZYMES INDUCED FOLLOWING PARTIAL**

HEPATECTOMY. *(E.)* Labow, R. (New York State Dept. Hlth., Albany), G. F. Maley and F. Maley. *Cancer Res* 29(2): 366-372, 1969.

The synthesis of thymidine kinase, thymidylate kinase, thymidylate synthetase, DNA polymerase, and deoxycytidylate deaminase was initiated at about 12 hr following partial hepatectomy of albino rats. Methotrexate (0.5 mg i.p.) inhibited the synthesis of all of the above enzymes with the exception of thymidylate synthetase, which was markedly stimulated. The synthetase activity was fourfold greater than that of the uninjected controls at 48 hr following partial hepatectomy, and at 72 hr it was 10- to 15-fold higher. At the latter time interval, the synthetase was still increasing in activity in the treated rats, while the enzyme activity in the control rat livers was decreasing. Puromycin (10 mg i.p.) had no effect on the synthetase elevation, while actinomycin inhibited the increase partially. However, cycloheximide (50 μg/100 mg body weight), at levels that did not inhibit the normal rise in deoxycytidylate deaminase activity following partial hepatectomy, greatly inhibited the normal and Methotrexate-stimulated increase in synthetase activity. To emphasize the possiblity that the Methotrexate stimulation may be an indirect effect, folate (10 mg i.p.) was found to cause a similar, though less dramatic, increase in thymidylate synthetase activity.

1931 **HIGH AFFINITY AND LOW AFFINITY BINDING OF CA^{++} BY RAT LIVER MITOCHONDRIA.** *(E.)* Reynafarje, B. (Johns Hopkins U. Sch. Med., Baltimore, Md.) and A. L. Lehninger. *J Biol Chem* 244(3):584-593, 1969.

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1975 **EFFECT OF PHENOBARBITAL ADMINISTRATION ON THE SUBCELLULAR DISTRIBUTION OF ^{125}I-THYROXINE IN RAT LIVER: IMPORTANCE OF MICROSOMAL BINDING.** *(E.)* Schwartz, H. L. (Montefiore Hosp. & Med. Ctr., Bronx, N. Y.), G. Bernstein and J. H. Oppenheimer. *Endocrinology* 84(2):270-276, 1969.

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1977 **THE EFFECT OF NICOTINAMIDE ON METABOLITES OF FAT AND CARBOHYDRATE METABOLISM IN RAT BLOOD AND RAT LIVER.** *(Ger.)* Talke, H. (2nd Med. Clin., Johannes Gutenberg U., Mainz, Germany). *Verh Deutsch Ges Inn Med* 74:946-950, 1968.

1978 **QUANTITATIVE IMMUNOCHEMICAL DETERMINATION OF THE ISOZYMES OF ASPARTATE AMINOTRANSFERASE IN RAT LIVERS AND TRANSPLANTABLE RAT HEPATOMAS.** *(E.)* Nisselbaum, J. S. (Sloan-Kettering Inst. Cancer Res., New York, N. Y.) and O. Bodansky. *Cancer Res* 29(2):360-365, 1969.

1979 **ROLE OF INSULIN IN THE HEPATIC HANDLIN OF GLUCOSE.** *(E.)* Madison, L. L. (U. Texas Southwestern Med. Sch., Dallas). *Arch Intern Med* 123(3): 284-292, 1969.

1980 **ZINC CONTENT AND SPECIFIC ACTIVITY OF HORSE LIVER ALCOHOL DEHYDROGENASE ISOENZYMES.** *(E.)* Sandler, N. (U. Hawaii Sch. Med., Honolulu) and R. H. McKay. *Biochem Biophys Res Comm* 35(1):151-155, 1969.

1981 **STUDIES ON THE INCORPORATION OF L-ETHIONINE-ETHYL-1-^{14}C INTO THE TRANSFER RNA OF RAT LIVER.** *(E.)* Ortwerth, B. J. (Oak Ridge Natl. Lab., Tenn.) and G. D. Novelli. *Cancer Res* 29(2):380-390, 1969.

1982 **THE CONVERSION OF THE CARCINOGEN N-HYDROXY-2-FLUORENYLACETAMIDE TO O-AMIDOPHENOLS BY RAT LIVER *IN VITRO*. AN INDUCIBLE ENZYMATIC REACTION.** *(E.)* Gutmann, H. R. (Dept. Biochem., U. Minnesota, Minneapolis) and R. R. Erickson. *J Biol Chem* 244(7):1729-1740, 1969.

1983 **REGULATORY ROLE OF BILE ACIDS IN CHOLESTEROL METABOLISM.** *(Sp.)* Guzman Garcia, J. (Med. Fac. Natl. Autonomous U. Mexico, Mexico City). *Gac Med Mex* 97(9):1136-1141, 1967.

1984 **THE EFFECT OF OXAPHENAMIDE ON BILIATION IN EXPERIMENTAL RADIATION SICKNESS.** *(Rus.)* Skakun, N. P. (Ternopol Med. Inst. USSR) and A. A. Borisenko. *Farmacol Toksik* 32(1):71-73, 1969.

1985 **THE EFFECT OF APILAK ON SOME INDICES OF LIPID METABOLISM.** *(Rus.)* Makarova, V. G. (Pavlov Med. Inst., Ryazan, USSR). *Farmakol Toksik* 32(1):63-65, 1969.

See also 2037,2342,2351,2381,2390,2395,2416,2417,2419,2425,2427,2428,2429,2431,2483,2502

986 **THE SEROTONIN AND KININ-PRODUCING ACTIVITY IN FRACTIONS OF MUCOSA FROM HE SMALL INTESTINE OF RABBITS.** *(Ger.)* Burger, A. nst. Pharmacol., U. Tübingen, Germany), F. Lembeck and J. agner. *Naunyn Schmiedeberg Arch Pharm Exp Path* 261(5): 12-421, 1968.

omogenates of rabbit small intestine were centrifuged at
8,000 x G, and the sediment was separated into 5 fractions
y gradient-density centrifugation with 1.8 and 2.0 M sucrose.
t both sucrose concentrations there was a correlation between
erotonin values and the hydrolysis of benzoylarginine ethyl
ster (BAEE). When rabbits were killed 22 hr after receiving
mg/kg of reserpine i.v., the sediment obtained at 18,000 x G
ontained 10% less serotonin than that from untreated rabbits,
ut no changes occurred in BAEE-hydrolyzing activity. When
uspensions of sediment obtained at 18,000 x G and fractions
rom gradient-density centrifugation were incubated with excess
ininogen, there was a linear relation between increases in kinin
ctivity and incubation time. Soyabean trypsin inhibitor had
o effect on kinin formation or BAEE-hydrolysis, even at a
oncentration of 25 mg/ml. Diisopropylfluorophosphate (DFP)
nhibited both processes to the same extent; there was a linear
elation between inhibition and DFP concentration. This be-
avior is also observed with pancreatic kallikrein. When 4-6 ml
f homogenate were given i.v. to dogs, in 2 cases a decrease in
lood pressure was observed which was smaller than that pro-
uced by 0.3 U of pancreatic kallikrein. When administered
.v. to dogs, acetic acid extracts of the sediment obtained at
8,000 x G reduced the blood pressure to the same extent
s 0.2-0.3 U of pancreatic kallikrein. Only a slight reduction
n blood pressure occurred when the extract was first incubated
vith 1000 inhibitor U of Trasylol. The effects of these sub-
tances on blood pressure in dogs are considered nonspecific
ince they could not be consistently reproduced and were not
orrelated to kinin formation or BAEE-hydrolysis. Thus, the
inin-forming activity of the intestinal mucosa cannot be defi-
nitely identified as pancreatic kallikrein. Because of its great
n vitro kinin-forming activity, it is unlikely that kallikrein was
estroyed during preparation.

1987 **EFFECT OF ETHANOL ON THE ALKALINE PHOSPHATASE ACTIVITY OF THE SMALL INTESTINE IN RATS.** *(Pol.)* Bargielska, A. (1st Clin. Int. Dis., Polish Acad. Med., Szczecin, Poland), B. Kosmowska, H. Panowicz and M. Woyke. *Pat Pol* 19(3/4):483-492, 1968.

When isolated segments of rat small intestine, 40 cm long, were perfused with ethanol (0.2-5% in Krebs-Henseleit buffer, pH 7.4, plus glucose) in a Smyth-Whaler apparatus for 30 min, the alkaline phosphatase activity in the mucosa, as demonstrated both biochemically and histochemically, was essentially the same as in control segments. Control segments perfused for 30 min with Krebs-Henseleit buffer showed morphological changes in the mucosa along with changes in the distribution of alkaline phosphatase in the cylinder cells of the intestinal epithelium and an insignificant increase in alkaline phosphatase activity in the glandular stratum of the mucosa. Incubation of mucosal homogenates with 0.2-5% ethanol also failed to affect the alkaline phosphatase activity.

1988 **IMMUNOGLOBULINS IN HUMAN SMALL INTESTINAL FLUID.** *(E.)* Plaut, A. G. (Southeast Asia Treaty Organization Med. Project, Bangkok, Thailand) and P. Keonil. *Gastroenterology* 56(3):522-530, 1969.

Immunological studies of intestinal fluid drawn from the ligament of Treitz area in normal man were performed. IgA was found to be the predominant immunoglobulin present among the three major classes, IgG, IgA, and IgM, on immunoelectrophoresis and as determined by an indirect quantitative radial diffusion technique specifically designed to study them. A nonimmunological precipitate occurring between human intestinal juice and a component in several subprimate sera and antisera is described. This precipitate was shown to seriously interfere with the quantitation of intestinal fluid immunoglobulins by the agar radial diffusion technique as usually used for serum and other body fluids.

1989 **TIME RESPONSE OF JEJUNAL SUCRASE AND MALTASE ACTIVITY TO A HIGH SUCROSE DIET IN NORMAL MAN.** *(E.)* Rosensweig, N. S. (Fitzsimons Gen. Hosp., Denver, Colo.) and R. H. Herman. *Gastroenterology* 56(3):500-505, 1969.

The time required for the adaptive changes in human jejunal sucrase and maltase activities when dietary carbohydrate was changed from glucose to sucrose, sucrose to carbohydrate-free, and glucose to fructose was studied in 4 volunteer subjects. The time for the increases and decreases in activity was 2 to 5 days and there was no further change for 9 weeks thereafter. This time response is similar to the estimated time for intestinal epithelial cell turnover in the small intestine of man. It is proposed that the changes in disaccharidase activity produced by changes in dietary sugar content are due primarily to an effect on the crypt cell. The effect becomes increasingly manifest as these crypt cells divide and migrate up the villus..

See also 1822,1844,1983

GENERAL

1990 **STUDIES ON THE BEHAVIOR OF THE NONESTERIFIED FATTY ACIDS AFTER HYPOPHYSECTOMY, PANCREATECTOMY, AND ALLOXAN TREATMENT IN THE DOG.** *(Ger.)* Beyer, J. (1st Med. Clin., Goethe U., Frankfurt/Main, Germany), K. Schöffling, E. Böhle, H. Ditschuneit, F. Melani, U. Cordes and E. F. Pfeiffer. *Therapiewoche* 18(46):2077-2078, 1968.

1991 **ACTION OF ORGANOPHOSPHATES ON PANCREATIC LIPASE.** *(E.)* Maylie, M. F. (Ctr. Biochem. & Molec. Biol., C. N. R. S., Marseille, France), M. Charles, L. Sarda and P. Desnuelle. *Biochim Biophys Acta* 178(1):196-198, 1969.

1992 **CARBOHYDRATE MOIETY OF BOVINE PANCREATIC DEOXYRIBONUCLEASE.** *(E.)* Catley, J. (Rockefeller U., New York, N. Y.), S. Moore and W. H. Stein. *J Biol Chem* 244(4):933-936, 1969.

1993 **ECOLOGICAL STUDIES OF INTESTINAL BACTERIA. RELATION BETWEEN THE SPECIFICITY OF FECAL ABO BLOOD GROUP ANTIGEN-DEGRADING ENZYMES FROM ENTERIC BACTERIA AND THE ABO BLOOD GROUP OF THE HUMAN HOST.** *(E.)* Hoskins, L. C. (VA Hosp., Cleveland, Ohio). *J Clin Invest* 48(4):664-673, 1969.

1994 **WEIGHT GAIN AND INTESTINAL HISTOLOGY OF RATS FED CHOLIC, LITHOCHOLIC, HYODEOXYCHOLIC, CHENODEOXYCHOLIC, AND DEOXYCHOLIC ACIDS.** *(E.)* Bray, G. A. (New England Med. Ctr. Hosp., Boston, Mass.) and T. F. Gallagher Jr. *Proc Soc Exp Biol Med* 130(1):175-177, 1969.

1995 **ABDOMINAL GAS VOLUME AT ALTITUDE AND AT GROUND LEVEL.** *(E.)* Greenwald, A. J. (USAF Sch. Aerospace Med., Brooks Air Force Base, Texas), T. H. Allen and R. W. Bancroft. *J Appl Physiol* 26(2): 177-181, 1969.

1996 **THE INTERACTION OF METAL IONS WITH POLYNUCLEOTIDES AND RELATED COMPOUNDS. XIII. THE EFFECT OF METAL IONS ON THE ENZYMATIC DEGRADATION OF RIBONUCLEIC ACID BY BOVINE PANCREATIC RIBONUCLEASE AND OF DEOXYRIBONUCLEIC ACID BY BOVINE PANCREATIC DEOXYRIBONUCLEASE I.** *(E.)* Eichhorn, G. L. (Natl. Inst. Child Hlth. & Human Development, NIH, Bethesda, Md.), P. Clark and E. Tarien. *J Biol Chem* 224(4):937-942, 1969.

1997 **FACTORS AFFECTING THE POLYUNSATURATED FATTY ACID CONTENT OF THE PLASMA LIPIDS OF SHEEP.** *(E.)* Moore, J. H. (Hannah Dairy Res. Inst., Ayr, Scotland), R. C. Noble and W. Steele. *Brit J Nutr* 22(4):681-688, 1968.

1998 **PROPERTIES OF CHROMATOGRAPHICALLY PURIFIED BOVINE PANCREATIC DEOXYRIBONUCLEASE.** *(E.)* Price, P. A. (Rockefeller U., New York, N. Y.), T. Y. Liu, W. H. Stein and S. Moore. *J Biol Chem* 244(4):917-923, 1969.

1999 **INCREASED VASCULAR PERMEABILITY CAUSED BY THE TRYPSIN-LIKE ENZYMES PURIFIED FROM RAT SUBMANDIBULAR GLAND.** *(E.)* Ekfors, T. O. (Dept. Anat., U. Turku, Finland), V. K. Hopsu-Havu and T. Malmiharju. *Acta Physiol Scand* 75(1/2):157-160, 1969.

)0 THE ILCA REACTION (T. 66): A NEW TEST FOR HEPATOBILIARY DISEASES. *(It.)*
ntale, P. (Gen. Med. Clin., U. Genoa, Italy), G. Peris, E.
ora, C. Schenardi and G. C. Venturi. *Fegato* 14(4):461-474,
;8.

: Ilca test, which had been reported as being specific for
urbances in iron metabolism occurring in hepatobiliary
eases, was run on 210 patients (140 with various hepato-
ary diseases, 20 with gastrointestinal diseases not involving
liver, and 50 with other types of diseases). The results of
; test were compared with blood iron and transferrin levels,
loidal stability, and serum protein fractions. In contrast to
er reports in the literature, the Ilca test was not found to
specific for disturbances in hepatic iron metabolism. Posi-
: tests were not found exclusively in jaundiced patients or
patients with hepatobiliary diseases. However, it compared
orably with other colloidal stability tests, becoming positive
y early in hepatitis and hepatic sclerosis. Positive Ilca tests
re associated with various types of dysproteinemia and some-
ies the Ilca test became positive before the dysproteinemia
reloped.

**)1 THE VALUE OF THE MÜLLER-BEISSENHIRTZ METHOD FOR DETERMINING AMMONIA IN
VER DIAGNOSIS.** *(Ger.)* Wagner, K. (Charité Hosp.,
rlin, Germany), G. Schneider and D. Theuer. *Deutsch
sundh* 23(52):2459-2462, 1968.

sting blood-ammonia levels were determined by the Müller-
issenhirtz method on normal controls and patients with vari-
s liver diseases. With this method, ammonia determinations
1 be made without first isolating the ammonia as in Conway's
thod. Since the concentration of dye obtained in the
rtholet reaction is inversely proportional to active chlorine
the hypochlorite reagent, it was found necessary to make
lorine determinations in order to obtain reproducible results.
controls, fasting blood-ammonia values ranged from 20-60
% with a mean of 38.2 μg%. The difference between the
an ammonia value for controls and that for 20 subjects with
tologically confirmed chronic hepatitis was not significant.
e mean ammonia value for 50 patients with confirmed cir-
osis was 63.0 μg%, significantly higher than that for the
ntrols and patients with chronic hepatitis. Patients with de-
mpensated portal hypertension, ascites, bleeding esophageal
rices, and hepatic coma were excluded from this group.
e mean ammonia value for 19 patients with portacaval shunts
d 1 with a mesenterocaval shunt was 83.0 μg%. This was
nificantly higher than the mean for cirrhotic patients. The
iller-Beissenhirtz method is recommended for routine deter-
ination of blood ammonia values because of its simplicity
d reproducibility.

**)02 ESOPHAGOGASTROSCOPY FOR BLEEDING FROM THE UPPER GASTROINTESTINAL
RACT.** *(Ger.)* Bacher, E. (Joint Hlth. Organizations,
eustrelitz, Germany). *Z Ges Inn Med* 23(23):749-752, 1968.

ndoscopic examinations were performed on 196 patients with
ophageal and gastric bleeding. The results of radiological and
ıdoscopic examinations did not agree in 55.4% of 74 cases. Endoscopy was particularly valuable in the diagnosis of congestive, hemorrhagic, aphthous, and superficial ulcerative esophagitis, gastritis, and anastomoses, complicated hiatus hernia, early esophageal varices, advanced esophageal varices after massive hemorrhages and venous collapse, fundal varices, acute gastric erosion, and multiple lesions. Endoscopies were performed with 0.5 g of hexobarbital i.v., 120-200 mg of suxamethonium, intubation, and administration of oxygen. Under these conditions no side effects of anesthesia or complications were observed. Endoscopic examinations were not performed on patients known to have advanced esophageal varices because of the danger of damaging thin variceal walls. The source of bleeding was found in the stomach in 127 cases (54.8%), the esophagus or cardia in 39 (19.9%), and the stomach of patients who had undergone gastrectomies in 13 (6.6%). The site of bleeding was not found in 17 cases (8.7%). The unusually small percentage of cases in which the cause of bleeding could not be ascertained is attributed to the use of anesthesia and muscle relaxants.

2003 THE DIAGNOSTIC AND PROGNOSTIC VALUE OF BLOOD AMMONIA DETERMINATIONS IN MASSIVE GASTROINTESTINAL HEMORRHAGES. *(Ger.)* Ziegler, K. (Med. Clin., U. Rostock, Germany). *Z Ges Inn Med* 23(23):768-770, 1968.

High blood-ammonia levels were found in 3 cirrhotic patients with bleeding esophageal varices 2-6 hr after the onset of bleeding. This fact should be taken into consideration in the treatment of bleeding varices in cirrhotics who often receive large volumes of transfused blood. Determinations performed on blood stored for 1-30 days showed that relatively large increases in ammonia concentrations occurred during the first 10 days. The mean ammonia concentration was 0.2 μM/ml for 10-day-old blood and 0.4 μM/ml for 25-day-old blood. When about 400 ml of 14-day-old blood were given to a patient with compensated cirrhosis, no change occurred in arterial ammonia concentrations. In a patient with decompensated cirrhosis, however, arterial ammonia concentrations increased from 0.153 to 0.166 μM/ml. If large volumes of older blood are transfused into patients with bleeding esophageal varices, this might be enough to produce an exogenous hepatic coma or to make an existing coma worse.

2004 THE VALUE OF IMMUNOELECTROPHORESIS IN VARIOUS STAGES OF ALCOHOLIC HEPATITIS (SUBACUTE CLEAR CELL HEPATITIS, SUBACUTE FATTY HEPATITIS, CIRRHOGENOUS HEPATITIS AND LATENT CIRRHOSIS). *(Fr.)* Albot, G. (Hotel Dieu, Paris, France), J. Boisson and D. Foulon. *Actualites Hepatogastroent Hotel Dieu* 4(5):B197-B210, 1968.

Protein fractions were separated by immunoelectrophoresis in serum from 45 patients with subacute hepatitis, 9 with cirrhogenous hepatitis, and 18 with histologically confirmed cirrhosis. A characteristic electrophoretic pattern was found in cirrhosis: γ-globulin levels above 30% were diagnostic, while those between 20-30% could indicate that any of these 3 forms of liver disease was present. A great variety of electrophoretic patterns were found among patients with subacute hepatitis, but the characteristic cirrhotic pattern was not. Except for changes in γ_A-globulins, the percentage of patients with abnormal serum protein fractions was higher among the group with fatty hepatitis than among that with clear-cell hepatitis. The percentage of positive flocculation tests increased with advances in the histologically diagnosed stage of the disease. Until sclerosis developed, BSP retention also increased with advances in the stage of the disease.

2005 PANCREATIC LESIONS IN STOMACH CANCER: THE DIAGNOSTIC VALUE OF BLOOD SUGAR AND AMYLASE LEVELS.

(It.) Consorti, P. (Gen. Surg. Clin., U. Siena, Italy), R. Zolfanelli and G. Biagi. *Quad Sclavo Diagn Clin Lab* 4(2):188-195, 1968.

Blood sugar and amylase curves after ingestion of 0.70 g/kg of glucose were plotted for 12 patients with gastric neoplasms (7 with pancreatic metastases) and for 3 patients with no gastrointestinal disorders. In controls and patients with only gastric neoplasms the blood sugar and amylase curves were almost parallel, while in patients with stomach cancer and pancreatic metastases the blood sugar concentrations increased from their initial values and amylase activities decreased. Determination of serum amylase levels after a glucose load may therefore be of value in the diagnosis of pancreatic metastases.

2006 TOPOGRAPHIC DIAGNOSIS OF GASTROINTESTINAL PROTEIN LOSS.

(E.) Westergaard, H. (Dept. Pediat., State Hosp., Copenhagen, Denmark), S. Jarnum, H. Jensen, J. Soltoft and M. Yssing. *Digestion* 1(6):341-352, 1968.

In 29 cases of protein-losing gastroenteropathy (6 children and 23 adults) diagnosed by means of ^{51}CrCl$_3$, ^{51}Cr-albumin or ^{59}Fe-labeled iron dextran, the fecal excretion of radioiodine over a 5-day period was measured following injection of ^{125}I- and ^{131}I-labeled albumin (0.5 μC/kg i.v.). Fecal excretion was considerably elevated in patients with lesions of the colon (ulcerative colitis, Crohn's disease) and terminal ileitis and in children with intestinal lymphangiectasis, and was normal in 2 patients with gastric protein loss. In other patients with small intestinal lesions it was moderately elevated. When the influence of the magnitude of the protein loss on fecal radioiodine excretion was reduced by dividing the latter by the fractional catabolic rate of albumin, the fecal ^{51}Cr- or ^{59}Fe-excretion, or the fecal clearance of ^{51}Cr or ^{59}Fe, it was possible to distinguish between protein loss in the small intestine and in the colon, with the exception that patients with terminal ileitis displayed the same excretion pattern as patients with colonic diseases. However, patients with terminal ileitis had ratios between fecal radioiodine excretion and fecal clearance of ^{51}Cr or ^{59}Fe below 0.9 while those with diseases involving the colon had ratios greater than 0.9. In simultaneous studies with radioiodine-labeled albumin and radioiodine-labeled transferrin or immunoglobulin it was found that the fecal radioiodine from albumin and transferrin (percent of injected dose) was almost identical, while the fecal radioiodine from immunoglobulin was similar to that from albumin only in patients with protein loss in the colon. In patients with protein loss in the small intestine it was appreciably higher. This difference may become a reliable indicator of small intestinal protein loss.

2007 INSUFFLATION OF POWDERED TANTALUM IN THE ESOPHAGUS: NEW ESOPHAGOGRAPHIC TECHNIQUE.

(E.) Nadel, J. A. (U. California Med. Ctr., San Francisco), W. J. Dodds, H. Goldberg and P. D. Graf. *Invest Radiol* 4(2):57-62, 1969.

Powdered tantalum (3-7 g) was insufflated into the esophagus of 15 conscious cats, 2 anesthetized cats, one anesthetized dog and one conscious human volunteer in order to determine its value as a radiographic contrast material. Esophagograms of excellent detail were obtained in each study. Powdered tantalum proved to be an excellent contrast material because: 1) small amounts of tantalum provide adequate contrast for roentgenograms; 2) tantalum adheres to the esophageal mucosa and remains for 1-4 hr, even after administration of water; and 3) tantalum is chemically inert and is not absorbed from the gastrointestinal tract. The method shows promise as a research tool in animals, and may prove useful for clinical diagnostic examinations.

2008 SERUM PHOSPHOHEXOSE ISOMERASE– ITS VALUE IN THE DIFFERENTIAL DIAGNOSIS OF JAUNDICE.

(E.) Cohn, E. M. (Albert Einstein Med. Ctr., Northern Div., Philadelphia, Pa.), S. Winsten and E. B. Abramson. *Amer J Gastroent* 51(2):101-111, 1969.

The serum phosphohexose isomerase (PHI) level was determined a total of 184 times in 60 icteric patients with acute hepatitis (20), cirrhosis (16), common duct stone (12), or pancreatic carcinoma causing common duct obstruction (12). The incidence of abnormal serum PHI values (25-35% of the patients and 15-44% of the tests) was uniformly low in each disease entity. The small differences obtained could not serve to distinguish acute hepatitis from cirrhosis, obstruction of the common duct due to stone from carcinoma of the pancreas, or jaundice associated with hepatocellular disease from extrahepati biliary obstruction.

2009 SELECTIVE CELIAC ANGIOGRAPHY WITH SPECIAL REFERENCE TO CARCINOMA OF THE LIVER.

(E.) Viranuvatti, V. (Siriraj Hosp., Bangkok, Thailand), T. Yipinsoi, D. Bunyachote, K. Limwongse, U. Plengvanit and C. Kalayasiri. *Amer J Gastroent* 51(2):112-117, 1969.

Selective celiac angiography was performed in 41 patients (38 males and 3 females, 20-62 yr old). Each arteriogram was studied and evaluated in collaboration with the results of other diagnostic procedures, including peritoneoscopy, hepatic scanning, liver biopsy, and operative findings. No complications occurred in any of the patients. In 13 of 15 cases of primary carcinoma of the liver, the diagnosis was correct. There was no specific radiological pattern for each cell type of primary carcinoma. It was felt that primary and secondary carcinoma of the liver could not be distinguished from each other by arteriography alone. Peritoneoscopy combined with direct-vision liver biopsy gave the final diagnosis in all cases and was found to be superior to selective arteriography alone. Nodules less than 2 cm in diameter were usually missed by hepatic scanning.

2010 ARTERIOGRAPHY IN THE DIAGNOSIS OF HEPATIC LESIONS.

(Jap.) Murai, T. (Kure Nat

osp., Hiroshima, Japan), Y. Negawa, A. Miyashiro, O. urimura, K. Seki, K. Kirimoto, T. Kozuka and T. Nosaki. *yo* 22(11):1282-1290, 1968.

elective hepatic arteriography was used in the diagnosis of 8 patients (18-68 yr old) with various hepatic lesions during ie period 1965-67. In the 17 patients having malignant hepat- lesions (5 primary carcinomas and 12 with metastases from odominal malignancies), biopsy during laparotomy or autopsy as also performed. The arteriograms were made by the ercutaneous, transfemoral technique of Seldinger using an dman-Ledin curved-tip catheter and 15-30 ml of contrast iedium (either 80% Iothalamate or 76% Diatrizoate). There ere no significant complications. Major variations in the epatic arterial system were noted in 4 of the 28 cases. Ir- egularity in outline and tortuosity of the hepatic arteries was pathognomic finding in cirrhosis, while in chronic hepatitis ie findings were similar but less pronounced. In hepatic tu- iors the findings depended on the degree of vascularity, and ighly vascular tumors could be detected more easily than iose with hypovascularity because of the accumulation of ontrast medium. Selective hepatic arteriography, which is ery useful for detecting hepatic lesions although it cannot eadily differentiate between primary and secondary malig- ancies, may improve the presumptive clinical diagnosis so that he definite nature, degree, extent and location of the lesions iay be determined.

011 **DIAGNOSIS OF CHOLELITHIASIS BY MEANS OF ULTRASOUND.** *(Jap.)* Hamada, Y. Shimonoseki Natl. Hosp., Yamaguchi, Japan) and H. Amagase. *ryo* 22(11):1315-1319, 1968.

n an attempt to diagnose cholelithiasis by some means other han cholecystography, which is all too frequently unsuccessful, 1 patients (16 men and 15 women, 17-71 yr old) who were ubsequently subjected to biliary tract surgery were examined y ultrasound using an Aloka A-Scope at a frequency of 2.25 negacycles/second. When the ultrasonic diagnoses were com- ared with operative findings, the results were found to have een correct in 28 cases (90.3%). Ultrasound is concluded to e of value in the diagnosis of cholelithiasis.

2012 **THE DIAGNOSTIC VALUE OF CERULOPLASMIN DETERMINATIONS IN THE ENZYMATIC DIAGNOSIS OF LIVER DISEASES.** *(Ger.)* Lorentz, K. (1st Med. Clin., Med. Acad. Lübeck, Germany) and K. Gassdorf. *Z Gastroent* 6(6):414-417, 1968.

Ceruloplasmin activities were determined on serum from 50 normal blood donors, 25 patients with hepatic congestion caused by right cardiac insufficiency, and 125 patients with hepatobiliary diseases. These results were compared with the activities of 6 other serum enzymes. The mean ceruloplasmin activities were significantly elevated in patients with cholecystitis, acute hepatitis, hepatic congestion, and malignant neoplasms without metastases into the liver. There was wide scattering of ceruloplasmin values among 23 patients with cirrhosis. In normal controls there was a correlation between the activities of ceruloplasmin and acylcholine hydrolase, and in patients with cholecystitis there was a correlation between ceruloplasmin and alkaline phosphatase activities. None of the patients with hepatobiliary diseases had low ceruloplasmin activities.

2013 **RETROSPECTIVE STUDIES ON THE RADIOLOGICAL DIAGNOSIS OF GASTRIC CARCINOMA.** *(Ger.)* Maurer, H. J. (Surg. Clin., Rhenish Friedrich Wilhelm U., Bonn, Germany) and G. Wagner-Römer. *Z Ges Inn Med* 23(23):771-778, 1968.

A retrospective study was made of the preadmission X-rays taken on 102 of 204 patients with stomach cancer admitted during the 4-yr period 1963-66. A diagnosis of stomach cancer had not been established in 37 cases (36%) although characteristic radiological signs of cancer were present. About half (18) of these 37 patients had been X-rayed more than once before admission. On admission a diagnosis of stomach cancer or suspicion of stomach cancer had been made in only 15 of 22 patients with cancer of the cardia and fundus, 20 of 32 patients with cardial cancer, 19 of 31 patients with antral cancer, and 7 of 13 with involvement of the entire stomach. The period between the first X-ray and admission was more than 4 weeks in 61 cases, 1-3 months in 23 cases, 3-6 months in 15 cases, 6-12 months in 14 cases, and more than 12 months in 9 cases.

2014 **DIFFERENTIAL DIAGNOSIS: HEPATIC CIRRHOSIS OR CHRONIC HEPATITIS. THE EFFECT OF CHRONIC HEPATITIS AND HEPATIC CIRRHOSIS ON SULFOBROMOPHTHALEIN RETENTION IN THE BLOOD.** *(Ger.)* Vido, I. (Munic. Hosp., Kassel, Germany) and E. Wildhirt. *Munchen Med Wschr* 111(4):177-180, 1969.

An analysis of BSP retention, using Student's t-test, was made in 1339 patients with subchronic hepatitis, chronic hepatitis, and cirrhosis. During the stationary stage of the disease BSP retention was 7.2% for patients with chronic hepatitis and 12.2% for those with cirrhosis. This difference was statistically significant. During the active stage of the disease these values were 24.6% and 28.4%, resp. This difference was not statistically significant. There was no significant difference between BSP retention in patients with cirrhosis and portal hypertension and those with cirrhosis without portal hypertension, either in the active or the stationary stage of the disease.

2015 **THE VALUE OF DETERMINING INTRINSIC FACTOR IN THE GASTRIC JUICE IN THE STUDY OF VITAMIN B_{12} DEFICIENCIES.** *(Fr.)* Wolff, R. and J. P. Nicolas. *Bull Acad Nat Med (Paris)* 153(1/2):39-45, 1969.

Gastric juice from 29 normal controls and 85 patients with hyperchromic and normochromic anemia was analyzed for intrinsic factor by determining the rate at which radioactive vitamin B_{12} was absorbed in guinea-pig intestine. Determinations were also made of the rate at which radioactive vitamin B_{12}, administered p.o., was excreted in the urine with and without exogenous intrinsic factor. No intrinsic factor was found in any of the 62 patients with hyperchromic anemia, but intestinal absorption of vitamin B_{12} was normal. In 15 patients, including 3 who had undergone gastrectomies, no intrinsic factor was found and pernicious anemia was associated with intestinal malabsorption of vitamin B_{12}. In 8 cases intrinsic factor was present, but there was still intestinal malabsorption of vitamin B_{12}.

2016 GALLBLADDER TOMOGRAPHY IN THE DIAGNOSIS OF CHOLELITHIASIS. *(Jap.)* Honma, M. (Yamanaka Natl. Hosp., Ishikawa, Japan) and K. Kurumadani. *Iryo* 22(11):1273-1281, 1968.

Diagnostic studies in 46 patients revealed 36 cases of confirmed cholelithiasis and 10 false-positives. Among the 36 cases of cholelithiasis, 10 were diagnosed by plane X-rays, 15 by tomography, and 7 by both procedures, while in 4 cases the diagnosis was obscure with either method. Of the 10 false-positives, 5 were due to overlapping intestinal gas; 4 of these were taken by an X-ray tube moving at an angle of 50°, and 1 was taken at 20°. Experiments with phantoms showed that the shorter the distance moved by the X-ray, the better the visualization of stones even in the presence of intestinal gas. It is concluded that X-ray tomography is advantageous in the diagnosis of cholelithiasis.

2017 THE VALUE OF SELECTIVE ARTERIOGRAPHY IN GASTROINTESTINAL DISEASES. *(Fr.)* Arianoff, A. A. (St. Elisabeth Clin., Brussels, Belgium), E. H. Henrard, G. Vielle, M. Dejong, E. Magos and R. Lefevre. *Acta Gastroent Belg* 31(10):653-688, 1968.

Selective arteriography was performed 77 times to diagnose gastrointestinal diseases in 38 patients (11 women and 27 men). Arteriography was performed to diagnose gastrointestinal pain, the cause of which was not apparent with conventional radiological techniques, in 11 cases; the location of gastrointestinal tumors and possible metastases in 5 cases; suspected tumors in 11 cases; and hepatic metastases in 6 patients with diagnosed tumors. These arteriograms were obtained by catheterization of the celiac trunk (31 cases with 1 failure), catheterization of the superior mesenteric artery (28 cases with 1 failure), catheterization of the inferior mesenteric artery (6 cases with 1 failure), renal arteriography (6 cases with 1 failure), and simple aortography with Seldinger's method (5 cases). Failures were caused by stenosis of the celiac trunk in 1 case and arteriosclerosis in 3 cases. The examination had to be interrupted in 1 case after introduction of a catheter into the left femoral artery produced a large external hemorrhage. Secretin, given intraarterially during selective arteriography, produced trembling and false shock in 4 of 8 cases. This reaction was traced to impurities in the secretin. Vascular anomalies were found in 12 of these 38 patients.

2018 THE VALUE OF IMMUNOGLOBULINS IN THE DIAGNOSIS AND FOLLOW-UP OF LIVER DISEASES. *(Ger.)* Fateh-Moghadam, A. (1st Med. Clin., U. Munich, Germany), R. Lamerz, J. Eisenburg and M. Knedel. *Klin Wschr* 47(3):129-140, 1969.

Radial immunodiffusion was used for the quantitative determination of IgG, IgM, and IgA fractions in 55 patients with liver disease. They included 19 with acute viral hepatitis, 14 with chronic hepatitis, 16 with cirrhosis, and 6 with miscellaneous kinds of liver parenchymal damage. In acute viral hepatitis IgM values were greatly increased while IgG and IgA values were normal or slightly increased. The IgA/IgM ratio was normal to significantly reduced, the IgG/IgA ratio was normal to slightly increased, and the IgG/IgM ratio was normal to slightly decreased. In chronic hepatitis IgG levels were moderately to greatly increased, IgA levels were slightly or moderately increased, and IgM levels were normal or slightly increased. The IgG/IgA and IgG/IgM ratios were normal to significantly increased and the IgA/IgM ratio was in the high normal range or significantly increased. In cirrhosis the IgG and IgA levels were greatly increased while the IgM level was slightly reduce or increased. The IgG/IgA ratio was normal to significantly increased and the IgG/IgM and IgA/IgM ratios were significant increased. There were significant differences in IgG, IgA, and IgM levels between patients with acute hepatitis and those wit cirrhosis. Correlations were observed between the extent of mesenchymal proliferation, IgA and IgG levels, and the values of the IgG/IgM and IgA/IgM ratios. There were no correlatio between the extent of cell necrosis and the immunoglobulin concentration, between the IgM concentration and the results of the thymol turbidity test, or between the immunoglobulin concentration and the increase in SGOT and SGPT activities. Although immunoglobulin concentrations are not diagnostic for any form of liver disease, they are of value when evaluate along with clinical and biochemical findings.

2019 QUANTITATIVE CHANGES IN IMMUNOGLOBULINS IN CHRONIC INFLAMMATORY LIVER DISEASES. *(Ger.)* Schumacher, K. (Med. Clin., U. Cologne, Germany) and R. Gross. *Klin Wschr* 47(3):123-129, 1969.

Immunoglobulins from 72 patients with chronic liver diseases and 8 with acute hepatitis were studied by immunoelectropho sis, immunodiffusion, and gel-filtration techniques. Immunoelectrophoresis showed that immunoglobulin levels, particularl IgG levels, were elevated in chronic liver disease. Three chara teristic patterns of protein distribution were obtained with ge filtration: a normal pattern was found in patients without a preciable dysproteinemia, the macroglobulin fraction was increased in patients with chronic persistent hepatitis, and large increases in the 7S-globulin fraction with corresponding decreases in other serum proteins were found in patients with chronic progressive hepatitis. In a few cases patterns characteristic for myelomas were observed. Radial immunodiffusio showed that patients with chronic progressive hepatitis had large increases in IgG with smaller increases in IgA and IgM; those with chronic persistent hepatitis had only slight increase in IgG and IgA but a large increase in IgM; those with biliary cirrhosis had large increases in IgA and smaller increases in Ig and IgM; and those with alcoholic cirrhosis had a very large increase in IgA but only a few had increases in IgG and IgM. The pattern in acute hepatitis was similar to that found in chronic persistent hepatitis.

2020 THE EFFECT OF MORPHINE ON THE DUODENUM AND ITS VALUE IN THE DIAGNOSI OF PEPTIC ULCERS. *(Rus.)* Usova, N. A. (Cent. Inst. Postgrad. Med., Moscow, USSR). *Klin Med (Moskva)* 49(11): 87-93, 1968.

Between 10-60 min after administration of 0.005 g of morph s.c., barium contrast studies were run on 34 patients with ulc of the duodenal bulb and on 3 with ulcers complicated by choledochoduodenal fistulas. Morphine produced no complic tions, even in 12 patients with symptoms of gastrointestinal bleeding. Nausea was seen in only 1 case. Pressure increased in the duodenum 5-7 min after administration of morphine d o increased intestinal tonus, and barium was evacuated from he stomach with difficulty. Within 10-15 min after injection, morphine increased gastric tonus and peristalsis and hastened mptying of the contrast medium from the stomach. Then 0-60 min after injection, gastric peristalsis decreased in- ensity and frequency until it almost disappeared, stomach mptying slowed down, and a simultaneous increase occurred n intestinal tonus. Duodenal ulcers were visualized only after dministration of morphine in 5 of 34 patients with uncompli- ated ulcers. In 15 of these patients ulcers were located more ccurately after administration of morphine. In 1 case mor- hine made the ulcer more difficult to locate since it produced pyloric spasm. Choledochoduodenal fistulas were visualized n 3 cases 15-30 min after administration of morphine, but not without morphine.

021 MEASUREMENT OF GASTRIC EMPTYING RATE USING ^{131}I-HSA. A METHODOLOGICAL STUDY IN MAN. *(E.)* Bromster, D. (Serafim Hosp., Stockholm, Sweden), G. Carlberger and G. Lundh. *Scand J Gastroent* 3(6):641-652, 1968.

An isotopic method is described for determining the gastric emptying rate in man within a 2-hr period. Five experimental ubjects were given a homogeneous liquid meal containing 0 μC ^{131}I-human serum albumin (^{131}I-HSA) and 10 μC ^{25}I-polyvinylpyrrolidone (^{125}I-PVP). The passage of ^{131}I out of the stomach was then followed by selective measurement of gamma radioactivity over the stomach for 2 hr at 30-min ntervals, excluding any radioactivity originating from ^{125}I. The influence of geometric factors on the external measurements was also investigated, as well as the secretion of iodide by the salivary glands and the gastric mucosa. Samples of the gastric contents were collected by intubation simultaneously with the external counts, and the radioactivity from ^{131}I- and from ^{125}I was determined in these samples. Since ^{125}I-PVP s an inert substance, the ratio ^{125}I/^{131}I constituted a factor by which the external radioactivity measurements had to be multiplied to obtain a correction for the iodide secretion by the salivary glands and the stomach. This factor was also used to evaluate the emptying rate and the secretory ability of the stomach. Serial collections of the gastric contents made it possible to follow changes in pH, acidity and osmolarity. Gastric emptying curves were expressed in mathematical terms.

2022 LACTIC DEHYDROGENASE AND TETRACYCLINE FLUORESCENCE: A COMPARATIVE STUDY OF THEIR VALUE IN THE DIAGNOSIS OF GASTRIC CANCER. (PRELIMINARY COMMUNICATION). *(Sp.)* Ruiz, J. C. (Fac. Med., U. El Salvador, San Salvador), E. R. Hasbun, T. M. A. B. Martinez B. and D. Lemus de Moncada. *Arch Col Med El Salvador* 21(4):249-254, 1968.

When gastric juice was aspirated from 8 patients with radiologically or clinically diagnosed gastric cancer and from 7 noncancerous controls (including several with polyps or benign ulcers) after administration of demethylchlortetracycline, examination of the sediment under ultraviolet light revealed a definite yellow fluorescence (+++) in 3 of 5 cancer patients (in 3 the examination could not be carried out) and in only 1 of the 7 controls (+); a greenish fluorescence, which is interpreted as negative, was observed in 2 cases of each group, while 2 of the controls yielded "doubtful" results and 2 were definitely negative. The serum lactic dehydrogenase activity varied from 104 to 1075 U/ml in the cancer group (average within the normal range) and from 500 to 1800 U/ml in the controls (only 4 tested successfully). The lactic dehydrogenase levels in the aspirated gastric juice (obtained during administration of acetazolamide to keep the pH above 5.0) varied from 200 to 2000 U/ml in the cancer group and from 39 to 2000 U/ml in the controls. The average lactic dehydrogenase activity in the gastric juice was 88 U/ml higher in the cancer group than in the controls, which is not statistically significant. It is concluded that tetracycline fluorescence is a more reliable index of gastric cancer than elevation of the serum or gastric lactic dehydrogenase activity.

2023 UROKINASE IN PATIENTS WITH LIVER DISEASES. *(Pol.)* Zahorska-Markiewicz, B. (3rd Clin. Int. Dis., Silesian Acad. Med., Katowice, Poland). *Pol Arch Med Wewnet* 41(5):639-645, 1968.

Among 224 patients (18-73 yr old) with diseases of the liver and biliary tract, 106 of whom were jaundiced, the urokinase activity (degree of hydrolysis of plasma euglobulin after addition of a urine sample) ranged from 16 to 50% compared to 56% in 70 healthy controls. There was only a slight decrease (to 41-50%) in patients with hepatitis, cirrhosis or liver neoplasms without jaundice, and a marked decrease in jaundiced patients (to 25-26% in jaundiced patients with hepatitis or cirrhosis and to 16-17% in patients with obstructive jaundice). There was a significant inverse correlation between the serum bilirubin and the urokinase activity. In addition to the probable role of kidney damage accompanying hepatobiliary disease, the increase in urokinase activity may be ascribed to a hypothetical biliary factor which depresses urinary urokinase excretion, as well as to possible inhibitors of protein digestion.

2024 SUITABILITY OF THE GLUCOSE TOLERANCE TEST FOR THE STUDY OF INTESTINAL ABSORPTION. *(Pol.)* Cichecka, K. (2nd Clin. Int. Dis., Acad. Med. Krakow, Poland), H. Drożdż, A. Jedrychowski and B. Różankowska. *Pol Arch Med Wewnet* 40(5):537-549, 1968.

Theoretical equations are developed for evaluating the intestinal absorption of glucose on the basis of a comparison of the blood glucose curves after oral and intravenous administration of glucose (330 mg/kg). For purposes of comparison, data are then presented for intestinal absorption of glucose and D-xylose, glycogenolysis in the liver, glucose and lipid utilization, fecal lipids, vitamin A absorption and the fasting plasma vitamin A and β-carotene levels in 3 patients with malabsorption syndromes (idiopathic steatorrhea, hypogammaglobulinemia, and prior resection of the small intestine, resp.), 2 patients with pancreatitis, 13 with a prior gastrectomy, 11 with previous vagotomy and pyloroplasty, 4 with previous vagotomy and antrectomy, and 17 with cirrhosis. The normal value for absorption of glucose from the digestive tract (Q_{60}) was found to be 20-35 g (average 27.6 g) in 60 min. This was reduced to 14.8-16.3 g in the 3 patients with malabsorption syndromes, but results within the normal range were obtained in all the other groups. The results indicate that oral and parenteral glucose tolerance tests may be of value in the differential diagnosis of intestinal malabsorption.

2025 PLASMA LEVELS OF VITAMIN A AND BETA-CAROTENE AND THE VITAMIN A

LOADING TEST IN THE DIAGNOSIS OF INTESTINAL MALABSORPTION. *(Pol.)* Cichecka, K. (2nd Clin. Int. Dis., Acad. Med. Krakow, Poland), H. Drożdż, A. Jedrychowski and B. Różankowska. *Pol Arch Med Wewnet* 40(5):551-559, 1968.

Plasma vitamin A and β-carotene levels and the results of the vitamin A loading test (plasma vitamin A 4 hr after administration of 150,000 U in oil) were evaluated in 42 patients and 20 controls. In the controls, the fasting β-carotene level was 60.6 μg% while the vitamin A level increased from 45.8 μg% to 145.0 μg% after its administration. Markedly impaired vitamin A absorption (little or no increase in plasma levels after its administration) was found in 3 patients with known malabsorption (due to idiopathic steatorrhea, hypogammaglobulinemia and prior resection of the small intestine, resp.), 12 patients with a previous gastrectomy, and 16 patients with hepatic cirrhosis, but in 11 patients with prior vagotomy and pyloroplasty the plasma vitamin A level rose to 131 μg% (range 42-308 μg%) after administration of the loading dose. Vitamin A absorption was more severely impaired in patients with decompensated cirrhosis than in those with compensated cirrhosis (increases in plasma level to 60 and 91 μg%, resp.). Although the fasting plasma vitamin A and β-carotene levels were only 0-37 and 12-30 μg%, resp. in the 3 patients with known malabsorption, and were somewhat reduced in cirrhotics, essentially normal levels were seen after gastrectomy or vagotomy and pyloroplasty. It is concluded that the fasting plasma vitamin A level is of little value in the diagnosis of malabsorption.

2026 **THE POSSIBLE APPLICATION OF THE GASTRODUODENAL FIBERSCOPE TO THE DIAGNOSIS OF DUODENAL ULCERS IN CHILDREN.** *(Sl.)* Dvorský, A. (Res. Inst. Human Nutrit., Bratislava, Czechoslovakia), G. Nováková, K. Horečný and M. Průnyi. *Cesk Pediat* 23(5):390-396, 1968.

When 30 children (15 boys and 15 girls, 10-15 yr old) with a history of ulcer symptoms and a positive X-ray diagnosis of duodenal ulcer were subjected to endoscopic examination with a gastroduodenal fiberscope, the instrument could be inserted into the duodenal bulb in 2 cases and into the pyloric antrum in 26 cases (with visualization of the bulb in all but one), while in 2 cases the examination had to be interrupted. The results of endoscopy were negative in 25 cases, including 3 with postbulbar ulcers, 6 in which a relatively long time had elapsed since X-ray examination, and several in which the ulcer had not yet been demonstrated by X-ray either; ulcers of the duodenal bulb were revealed in 3 cases, and in 2 others endoscopy showed irritation of the bulb mucosa. Lesions of the pyloric antrum were detected in 2 children with a recent history of melena. It is concluded that the standard type of gastroduodenal fiberscope is suitable for the diagnosis of duodenal ulcers in children over the age of 10. The necessary technique, apparatus and premedication are described in detail.

2027 **THE USE OF END-TO-END TRANSINTESTINAL INTUBATION FOR THE STUDY OF LIPID ABSORPTION IN INFANTS.** *(It.)* Porta, L. (Pediat. Clin., U. Milan, Italy), A. Giunta, E. Fedeli and A. Tarenghi. *Minerva Pediat* 20(42):2170-2173, 1968.

An original gas-chromatographic method is described for determining the total lipid and fatty acid content of the intestinal fluids. Using this method and the technique of transintestinal intubation with the end of the catheter in the proximal ileum, lipid absorption after a special test-meal (18.8 g casein and lactalbumin, 22.3 g olive oil, 18.7 g lactose, 4.0 g polyethylene glycol and 295 g water per 1.76 m^2 of body surface area) was investigated in 6 infants (4-26 months old). Samples of intestinal contents were taken at 30-min intervals for 3 hr and analyzed by chloroform-methanol extraction and chromatography after heating at 70C for 10 min to inactivate pancreatic lipase. In 2 normal infants, the absorption of total lipids began 30 min after ingestion and reached 100% in 3 hr (45-50% in 2.5 hr). Oleic acid absorption was already 84% complete in 30 min, reaching a maximum of 90% at 2.5 hr. In dystrophic infants, on the other hand, total lipid absorption only began after 90 min and was only 45-55% complete in 3 hr, while oleic acid absorption was 62-75% complete in 2.5-3 hr.

2028 **THE DIAGNOSTIC VALUE OF DETERMINING THE INDEX OF GALLBLADDER MOTILITY IN CHILDREN.** *(Rus.)* Sorokin, E. V. (D. E. Dzerzhinskii Munic. Hosp. Children's Dis. No. 9, Moscow, USSR) and M. A. Filippkin. *Vop Okhr Materin Dets* 13(12):46-49, 1968.

Intravenous cholangiography was used to measure the diameter and length of the gallbladder in 250 children who had diseases of the biliary tract or who were suspected of having them and in 60 children with no gastrointestinal or biliary diseases. Measurements were made before and after ingestion of 2 raw egg yolks and the index of gallbladder motility was calculated from the formula d_2l_1/l_2d_1. Gallbladders emptied slowly in 50% of the children with biliary diseases, rapidly in 34%, and normally in only 16%. In children with slow emptying of the gallbladder, spasms of the sphincters were responsible if the index was greater than 0.75 and weak muscular contractions if the index was less than 0.75. In children with rapid emptying of the gallbladder, insufficient tonus of the biliary sphincters was present when the index was less than 0.59 and weak muscular contractions were responsible if the index was greater than 0.59 In patients with normal emptying of the gallbladder weak contractions were associated with insufficiency of the sphincters if the index was below 0.59. If the index was greater than 0.7 strong muscular contractions were associated with spasms of the biliary sphincters.

2029 **THE VALUE OF SCINTILLATION SCANNING AND ECHOGRAPHY OF THE LIVER IN DETERMINING THE OPERABILITY OF PATIENTS WITH CANCER OF THE GASTRIC CARDIA AND ESOPHAGUS.** *(Rus.)* Kharitonov, L. G. (Cent. Clin. Hosp., MPS, Moscow, USSR), Iu. N. Bogin and A. V. Upyrev. *Khirurgiia (Moskva)* 44(11):28-36, 1968.

Combined studies of the liver by scintillation scanning (using ^{131}I-Rose Bengal and colloidal ^{198}Au) and ultrasonic echolocation were carried out in 30 patients (19 men and 11 women, 40-70 yr old) with cancer of the esophagus (14 cases) or the upper portion of the stomach (16 cases, including 11 with esophageal involvement). In 21 cases, including the 3 in which scanning and echography showed liver metastases, the findings could be verified at surgery (19 cases) or autopsy (2 cases). Scanning with Rose Bengal was found to be less suitable than the other techniques for the diagnosis of hepatic involvement, particularly in patients with gastrostomies. It is elt that the combined use of scintillation scanning and ultra-onic echography will make possible a differentiation between icatricial changes and hepatic metastasis in many cases.

030 SOME PARTICULAR ASPECTS OF THE ENZYMOLOGICAL DIAGNOSIS OF LIVER DISEASE, BASED ON A STUDY OF 845 PATIENTS. *(Fr.)* Demeulenaere, L. (Med. Clin., State U. Ghent, Belgium), R. Rottiers, J. van Egmond and R. Lacrès. *Acta Gastroent Belg* 31(11):747-757, 1968.

Repeated determinations of serum liver enzyme levels (SGOT, SGPT, lactic dehydrogenase, leucine aminopeptidase, alkaline phosphatase) were carried out in 253 patients with hepatitis, 275 with cholangiopathies, 45 with cholecystitis, 176 with irrhosis, 81 with metastatic cancer and 15 with congestive eart failure. Pathological transaminase values were obtained n 236-237, 209-217, 11-16, 117-150, 38-64, and 8-13 cases n these 6 groups, and a pathological SGOT/SGPT ratio (1.0 r less) was obtained in 180, 127, 14, 51, 8 and 3 cases, resp. An analysis of these results and of the concordance and discordance between them and the other enzyme levels indicated hat an accurate diagnosis can rarely be achieved by determination of the SGOT and SGPT alone; thus, very high values are een most often in hepatitis, but also occur during the initial tages of an extrahepatic obstruction. A pathological SGOT/SGPT ratio is also most often encountered in hepatitis, and is particularly significant when combined with high absolute enzyme levels. Combined determination of the alkaline phosphatase and leucine aminopeptidase levels is often useful, both of hese enzymes being increased in hepatitis while a normal leucine aminopeptidase level is characteristic of obstructive jaundice. Metastatic cancer is most often characterized by elevated SGOT and alkaline phosphatase levels with a normal SGPT and a normal or slightly elevated leucine aminopeptidase. Differential determinations of the lactic dehydrogenase isoenzymes are most valuable in establishing a prognosis, a good prognosis being indicated by a return of LDH5 to a normal level in the presence of persistent elevation of the serum transaminases.

2031 MODERN PROCEDURES FOR THE STUDY OF GASTRIC SECRETION. III. PERSONAL EXPERIENCE WITH PENTAGASTRIN (I.C.I. 50,123) AS A GASTRIC SECRETORY STIMULANT. *(Sp.)* Meeroff, J. C. (Prof. Dr. G. A. Alfaro Polyclin., Lanus, Buenos Aires, Argentina), J. A. Rofrano, N. Marchevsky and M. Meeroff. *Rev Esp Enferm Apar Dig* 27(9):1281-1288, 1968.

The gastric stimulatory effects of pentagastrin (Peptavlon) and its suitability as an agent for testing the secretory capacity of the stomach were studied in 15 patients with duodenal ulcers, 10 with gastric ulcers, 15 with gastritis, and 20 normal controls. The mean pH of the gastric secretion at a dose of 12 μg/kg was 1.08, 1.18, 1.60 and 1.17, resp., in the 4 groups. The corresponding figures were 272.86, 161.10, 139.93 and 216.85 cc for the volume secreted in 60 min; 76.80, 55.87, 34.93 and 67.81 mEq/liter for the H^+ ion activity; 119.64, 86.12, 59.54 and 97.20 mEq/liter for the titratable acidity; 32.07, 14.80, 9.51 and 20.82 mEq/hr for the total acid production; and 17.62, 25.54, 31.70 and 19.83 mEq/liter for the sodium ion concentration. It is concluded that pentagastrin is an effective stimulant of gastric acid secretion, with a potency somewhat below that of Histalog or the heptadecapeptides gastrin I and II. However, the side effects of 12 μg/kg (abdominal discomfort, headache and lipothymia) are not negligible, and similar side effects, although less severe, were also seen at 6 μg/kg. The combined acid values were higher than with histamine or Histalog, presumably because pentagastrin has a greater stimulatory effect on the secretion of mucus.

2032 ARTERIOGRAPHY IN THE SURGICAL DIAGNOSIS OF THE ABDOMINAL ORGANS. *(Ger.)* Wenz, W. (Surg. Clin., U. Heidelberg, Germany). *Langenbeck Arch Klin Chir* 322(Kongressber.):127-139, 1968.

Abdominal angiography, which makes possible the direct visualization of the liver, spleen, pancreas, the walls of the hollow organs and the circulatory system, was used in the radiological diagnosis of 300 patients (2-78 yr old with a maximum in the 6th decade). Selective angiography was the most commonly used procedure (219 cases), followed by the aortographic technique of Seldinger (1953) (52 cases) and then by lumbar aortography (technique of Dos Santos *et al.*, 1929) (29 cases). There were only 4 transitory complications (thrombosis, hematoma) and no lasting sequellae. The angiographic diagnosis was correct in 96 of 113 patients with tumors, 52 of 53 with vascular diseases, 16 of 16 with inflammations, 8 of 8 with abdominal trauma, and 96 of 110 patients subjected to the procedure to exclude the above diagnoses. Based on this experience, the main indications for abdominal angiography are concluded to be abnormalities in the abdominal circulation, space-occupying lesions of the large abdominal organs, blunt abdominal trauma, and severe gastrointestinal bleeding of unknown etiology.

2033 COMPARISON OF THE EFFECT OF HISTAMINE AND PENTAGASTRIN ON GASTRIC SECRETION IN ULCER PATIENTS. *(E.)* Emas, S. (Allmanna Hosp., Malmö, Sweden), B. Lilja and I. Borg. *Scand J Gastroent* 4(2): 151-156, 1969.

The effect of histamine dihydrochloride (24 μg/kg body weight s.c.) and pentagastrin (6 μg/kg s.c.) on volume and gastric acid output was compared in 18 ulcer patients. The time course for the volume or acid response to histamine and pentagastrin was very similar. In 14 patients both stimulants increased acid secretion during the first postinjection 15-min period and the maximal acid output occurred during the second to fourth periods. Neither volume output nor acid output, expressed as maximal output per 15 min or peak 30-min output independent of time after the injection of the stimulants, differed significantly. A highly significant correlation was found between both the volumes and the acid outputs after histamine and pentagastrin.

2034 VALUE OF DIFFERENTIAL THERMOSTABILITY, UREA INHIBITION, AND GEL FILTRATION OF ALKALINE PHOSPHATASE IN THE IDENTIFICATION OF DISEASE STATES. *(E.)* Fennelly, J. J. (St. Paul's Chemother. Unit, Dublin, Ireland), M. X. Fitzgerald and K. McGeeney. *Gut* 10(1):45-51, 1969.

Differential thermostability, urea inhibition and gel filtration of serum alkaline phosphatase was measured in 4 groups of blood donors: 1) medical and laboratory personnel (controls), 2) patients with hepatobiliary disease, 3) patients with skeletal disease and 4) patients with neoplasms who had biochemical and radiological evidence of both hepatic and osseous involvement. It was found that serum alkaline phosphatase in skeletal disease is markedly thermolabile, sensitive to 2 molar urea and moves in one 7S peak on gel filtration, whereas serum in hepatic disease is relatively thermostable, more resistant to urea, and moves as two peaks (19S and 7S) on gel filtration. The pattern of control serum enzyme resembles more that of skeletal disease. Both heat and urea inactivation provided simple and rapid methods of differentiating the origin of a raised serum alkaline phosphatase level.

2035 **pH OF THE DUODENUM OF PATIENTS WITH AND WITHOUT DUODENAL ULCERS MEASURED WITH A RADIOTELEMETERING CAPSULE.** *(E.)* Aynaciyan, A. V. (U. Toronto, Canada) and J. R. Bingham. *Gastroenterology* 56(3):476-482, 1969.

By means of a small radiotelemetering capsule (Heidelberg capsule) attached to a thin tape, prolonged pH measurements of the duodenal bulb and of the postbulbar region were made in nonulcer and duodenal ulcer subjects both in the fasting state and after gastric acid secretion had been stimulated by histalog. The following results were obtained. The mean duodenal bulb pH of 24 fasting nonulcer and 22 fasting ulcer subjects was the same. The mean postbulbar pH of 19 fasting nonulcer and 15 ulcer subjects was the same, but higher than was the bulb pH. After stimulation of gastric secretion by histalog, the mean bulb pH of 8 nonulcer subjects and of 10 ulcer subjects decreased but the decrease was significantly greater for the ulcer group. The postbulbar pH of both groups decreased slightly but the decrease for the ulcer group (9 subjects) was not greater than was the decrease for the nonulcer group (11 subjects).

2036 **ROENTGEN FINDINGS IN ACUTE APPENDICITIS.** *(E.)* Tegtmeyer, C. J. (George Washington U. Hosp., Washington, D. C.), J. R. Thistlethwaite and T. F. Sneed. *Med Ann DC* 38(3):127-130, 1969.

2037 **DETERMINATION OF RAT LIVER HEXOBARBITAL OXIDASE ACTIVITY WITH A GAS-CHROMATOGRAPHIC METHOD.** *(E.)* den Tonkelaar, E. M. (Natl. Inst. Publ. Hlth., Utrecht, Netherlands), A. Klap-van Dijk and S. L. Wit. *Biochem Pharmacol* 18(1):262-265, 1969.

2038 **THE CURRENT STATUS OF LIVER FUNCTION TESTS.** *(It.)* Cagli, V. *Policlinico [Prat]* 76(1): 18-23, 1969.

2039 **PANCREATIC SURGERY: COMPARISON OF ARTERIOGRAPHIC, SCINTIGRAPHIC AND SURGICAL FINDINGS.** *(Fr.)* Doutre, L. P., P. Blanquet, J. Tavernier and C. Beck. *Bordeaux Med* 2(2):351-354, 1969.

2040 **PRACTICAL ADVICE ON MANAGEMENT DURING INTRAVENOUS CHOLANGIOGRAPHY.** *(Fr.)* Helie, J. (Fernand Widal Hosp., Paris, France), G. Ducellier and Y. Michelier. *Sem Hop Paris* 45(12):786-790, 1969.

2041 **DIAGNOSIS OF THE HABITUAL VOMITING OF INFANTS.** *(Fr.)* Roget, J. and A. Beaudoing. *Med Infant* 76(1):5-10, 1969.

2042 **STUDIES OF LIPID CHEMISTRY IN 150 PUNCH BIOPSIES OF THE LIVER AND THE RELATION OF LIPIDS TO HISTOLOGICAL, CLINICAL, AND CLINICO-CHEMICAL FINDINGS.** *(Ger.)* Kremer, G. J. (2nd Med. Clin., Gutenberg U., Mainz, Germany), F. K. Kössling, H. J. Lange and N. Victor. *Therapiewoche* 18(46):2075-2076, 1968.

2043 **THE VALUE OF THE ROSE BENGAL TEST IN DIAGNOSING OBSTRUCTIVE JAUNDICE IN THE NEWBORN.** *(Ger.)* Donath, A. (Pediat. Clin., U. Bern, Switzerland). *Praxis* 57(49):1730-1732, 1968.

2044 **RADIOLOGICAL EXPLORATION IN NEONATAL AND INFANTILE VOMITING.** *(Fr.)* Cottet, J. J. and M. Coulomb. *Med Infant* 76(1):59-62, 1969.

2045 **ELECTROPHORESIS ON POLYACRYLAMIDE GEL: ITS VALUE IN HEPATOLOGY AND PARTICULARLY IN CIRRHOSIS.** *(Fr.)* Aron, E. (Tours, France), R. Vargues, J. D. Weill and J. N. Lamy. *Arch Franc Mal Appar Dig* 58(1/2):41-50, 1969.

2046 **LYMPHOGRAPHY IN HEMORRHAGIC RECTOCOLITIS.** *(Fr.)* Perreau, P. (Angers Hosp., France F. Joubaud and F. Larra. *Actualities Hepatogastroent Hotel Dieu* 4(4):A249-A255, 1968.

2047 **CHANGES IN THE AMYLASE ACTIVITY IN THE SERUM AND URINE OF PATIENTS WITH CERTAIN DISEASES.** *(Ser.)* Trpinats, P. (Inst. Chem. Med. Fac., Belgrade, Yugoslavia), R. Vlajnić, V. Pavlović, V. Mihailov and M. Baretič. *Med Pregl* 21(9/10):347-349, 1968.

2048 **THE RADIOLOGICAL DIAGNOSIS OF ACUTE GASTROINTESTINAL BLEEDING.** *(Ger.)* Wenz W. (Surg. Clin., U. Heidelberg, Germany). *Chirurg* 40(3):100-105, 1969.

2049 **HEPATIC ARTERIOGRAPHY. [EDITORIAL]** *(E.)* Baum, S. *Amer J Gastroent* 51(2):151-153, 1969.

2050 **THE SELLEK-FRADE COPPER ACETATE TEST IN LIVER DISEASES.** *(E.)* Sellek, A. (Pedro Borras Astorga Child. Hosp., Havana, Cuba) and A. Del Frade. *Fegato* 14(4):555-566, 1968.

2051 **HISTALOG SHOCK. [CASE REPORT]** *(E.)* Uthman, S. M. (U. Cincinnati Coll. Med., Ohio) and A. M. Hoyumpa Jr. *Amer J Dig Dis* 14(4):275-277, 1969.

2052 **RAPID DIAGNOSTIC APPROACH TO AMEBIC LIVER ABSCESS. [CASE REPORT]** *(E.)* Weng J. (Emory U. Sch. Med., Atlanta, Ga.) and J. C. Coberly. *Ame J Dig Dis* 14(4):282-289, 1969.

2053 **THE RECTO-SIGMOID BIOPSY.** *(E.)* Justi, R. (South Miami Hosp., Florida), M. M. Sayet and R. L. Swink. *Amer J Proctol* 20(2):115-117, 1969.

2054 **ANALYSIS OF PREMEDICATION FOR SIGMOIDOSCOPY: A COMPARATIVE STUDY WIT**

HLORDIAZEPOXIDE ALONE AND IN COMBINATION WITH LIDINIUM BROMIDE. *(E.)* Ehrlich, R. (Boston, Mass.). *Amer Proctol* 20(2):130-133, 1969.

055 **STUDIES OF STOMACH SECRETION ANALYSIS WITH GASTRIN ANALOGS.** *(Ger.)* ickenbusch, W. (2nd Med. Clin., U. Kiel, Germany), D. chemmel and I. Brockmann. *Verh Deutsch Ges Inn Med* 4:222-224, 1968.

056 **THE USE OF MULTIVARIANT STATISTICAL METHODS TO EVALUATE CLINICAL CHEMSTRY DATA IN THE DIFFERENTIAL DIAGNOSIS OF HREE DISEASE GROUPS.** *(Ger.)* Delbrück, A. (Med. Clin., led. Coll., Hamburg, Germany), J. Ferlemann, E. Greiser, D. ock and B. Schneider. *Verh Deutsch Ges Inn Med* 74:187-90, 1968.

057 **A NEW TEST FOR PANCREATIC LIPASE AND ITS CLINICAL APPLICATION.** *(Ger.)* Kaffarnik, . (Med. Polyclin., U. Marburg/Lahn, Germany) and J. G. Meyer-Bertenrath. *Verh Deutsch Ges Inn Med* 74:237-238, 1968.

2058 ***IN VITRO*** **STUDIES OF A NEW SUBSTRATE FOR FUNCTIONAL DIAGNOSIS OF THE EXOCRINE PANCREAS.** *(Ger.)* Meyer-Bertenrath, J. G. (Med. Polyclin., U. Marburg/Lahn, Germany) and H. Kaffarnik. *Verh Deutsch Ges Inn Med* 74:236, 1968.

2059 **SERUM LIPASE AND AMYLASE IN PANCREAS DIAGNOSIS. EXPERIENCE WITH A NEW METHOD FOR LIPASE DETERMINATION.** *(Ger.)* Goebell, H. (Med. Clin., U. Marburg/Lahn, Germany), C. Bode and G. Lemberg. *Verh Deutsch Ges Inn Med* 74:233-235, 1968.

2060 **SERUM LIPASE DETERMINATION IN PANCREATIC DISEASES.** *(Ger.)* Rick, W. (1st Med. Clin., U. Dusseldorf, Germany). *Verh Deutsch Ges Inn Med* 74:230-233, 1968.

See also 1870,1894,2148,2151,2345,2351,2400,2500,2539

GASTROINTESTINAL DISEASES

ESOPHAGUS

2061 TECHNIQUE FOR AND LONG-TERM RESULTS OF THE SURGICAL TREATMENT OF CARDIOSPASM. *(Rus.)* Kolesov, V. I. (I. P. Pavlov 1st Leningrad Med. Inst., USSR) and A. N. Tsareva. *Khirurgiia (Moskva)* 45(2):3-6, 1969.

A new approach, transverse wide laparotomy, was developed for obtaining access to the subdiaphragmatic space in the treatment of cardiospasm. This procedure was used on 15 patients (11 women and 4 men) with histories of cardiospasm dating back 1.5-30 yr (mean of 7 yr). All had severe esophageal scarring. During mobilization the mucosa was damaged in 7 cases and had to be repaired by suturing with an atraumatic needle and very fine silk. After mobilization the scarring and muscle defect in the esophagus was covered with the omentum without cutting out a flap. There were no operative deaths and none of the patients developed infections. Excellent long-term results were obtained in 8 cases. Of the 7 others, 4 developed trouble in swallowing 2 yr after surgery and 2 had moderate dysphagia with radiological signs of periesophagitis. Another patient underwent esophageal dilatation 8 yr after surgery although he had no difficulty in swallowing food.

2062 SURGICAL TREATMENT OF ESOPHAGEAL CANCER: RESULTS OF 23 YEARS OF EXPERIENCE. *(Fr.)* Lortat-Jacob, J. L. *Bull Acad Nat Med (Paris)* 153(1/2):17-22, 1969.

Esophageal cancer was diagnosed in more than 4000 patients between 1944 and 1968 and operations were performed on 1769. Esophageal resections were performed on 1027 (58%). The operative mortality was highest (38%) for cancers in the upper 1/3 of the esophagus and lowest for those located toward the bottom (20% for cancers of the cardia and 23.4% for those in the lower 1/3). The survival rate was 75.6% for patients treated by esophagogastric anastomosis, 56.5% for those with esophagogastric anastomoses and aortic separation, and 62.5% for those undergoing Thorek's procedure. Only 84 of the patients in the latter group later underwent esophagoplasty. Palliative surgery was performed on 741 of these 1769 patients (41%) with an operative mortality of 22.0% and a 1-yr survival rate of only 10%. For cancers located in the lower 1/3 of the esophagus the 1-yr survival rate was 55.2%, the 5-yr survival rate 11.4%, and the 10-yr survival rate 7%. The corresponding survival rates for cancers of the middle 1/3 were 52%, 8.5%, and 5%, resp. and those for cancers of the cardia were 65.1%, 6.2%, and 1%, resp. Only 30% of the patients with cancers of the upper 1/3 survived 1 yr and none survived more than 4 yr.

2063 RESULTS OF THE SURGICAL TREATMENT OF ESOPHAGEAL ATRESIA (108 CASES, CURRENT INDICATIONS). *(Fr.)* Jaubert de Beaujeu, M. (Debrousse Hosp., Lyon, France), P. Mollard and A. Campo-Paysaa. *Mem Acad Chir (Paris)* 94(27/28):805-818, 1968.

Results of surgery are reported for 86 infants with esophageal atresia, operated on between 1955 and 1966, and for 22 infants operated on between 1966 and 1968. In the first series direct anastomoses were made on 62 of the 75 with esophagopleural fistulas. Of the 33 deaths occurring in these 62 cases, 13 were due to esophagopleural fistulas, 11 to bronchopneumopathies, 4 to anoxia and brain damage, 2 to malabsorption and evisceration after gastrostomy, 1 to spontaneous gastric perforation, 1 to stenosis after a pneumopathy and repeat operation, and 1 to undetermined causes. Factors complicating surgery were prematurity in 11 cases (8 deaths), severe pulmonary disorders in 29 cases (21 deaths), associated malformations in 18 (8 deaths), and difficulties in making the anastomosis in 13 (8 deaths). There were 21 deaths among the 24 infants on whom direct anastomoses could not be made. These included 3 of 3 with coloplasties, 13 of 16 with Leven and Ladd's procedure, and 5 of 5 with aspiration and gastrostomy. Direct anastomoses were made on 18 of the 24 infants in the 2nd series. Of the 7 infants who died 4 had multiple congenital anomalies and 2 were very premature. Errors in treatment were responsible for death in 1 case. In 4 children anastomoses were anatomically impossible. Two patients recovered after coloplasties and 1 after Howard's procedure; 1 premature infant died.

2064 PLASTIC SURGERY OF THE HYPOPHARYNX AND ESOPHAGUS USING THE LARGE INTESTINE. *(Ger.)* Szabó, L. E. (U. Med. Sci., Budapest, Hungary) and A. Réthi. *Acta Chir Acad Sci Hung* 9(4):389-397, 1968.

Replacement of the hypopharynx and esophagus by various segments of the transverse colon and ileocecal region (3 cases) was carried out in 21 patients (using an antethoracic approach in 11 cases and an intrathoracic extrapleural or retrosternal approach in 10); in most cases the operation was single-stage, although in a few cases an 8-10 day interval preceded reestablishment of continuity. Functional results were generally good in the 19 survivors. Among the 4 cases given antiperistaltic transplants, however, several showed regurgitation and in 1 case this was severe. Since no such complication occurred among the 17 patients given isoperistaltic transplants, this method is recommended. Possible abnormalities in the vasculature of the large intestine which may affect the choice of intestinal segment and surgical technique are discussed. It is felt that the use of the ileocecal segment has definite advantages.

2065 PHYSIOLOGY OF THE DISTAL ESOPHAGUS IN ACHALASIA. *(E.)* Heitmann, P. (Inst. Physiol. Gastroent. Ctr., Santiago, Chile), J. Espinoza and A. Csendes. *Scand J Gastroent* 4(1):1-11, 1969.

Intraluminal manometric studies were performed in 30 normal adults and in 16 symptomatic patients with the radiological features of achalasia by the use of a constant catheter perfusion technique. A normotensive gastroesophageal sphincter was found in every patient with achalasia. Sphincteric fall in pressure on swallowing was found in 92.7% of the swallows in 12 of the 16 patients with achalasia. In 4 patients, no fall in sphincteric pressure was recorded on swallowing. A significant increase in resting sphincteric pressure occurred after an s.c. injection of 2.5 mg Urecholine (beta-methylcholine chloride urethane); 98% of swallows were followed by sphincteric fall in pressure under the action of this agent in all patients tested. The nature of the dynamic abnormality most frequently found in achalasia is discussed. It is concluded that results obtained ith the use of a constant catheter perfusion technique during traluminal pressure measurements should lead to a re-evalua- on of currently accepted concepts on the pathophysiology of chalasia.

066 PORTACAVAL SHUNT AS AN EMERGENCY OPERATION IN ACUTE MASSIVE HEMOR- HAGE FROM ESOPHAGEAL VARICES. *(Ger.)* Bachmann, . (Surg. Clin., Free U. Berlin, Germany), J. Eckart, H. Franke, . Kolb, P. Körtge and K. J. Wollmann. *Langenbeck Arch lin Chir* 323(2):91-123, 1968.

mong 224 cases of upper gastrointestinal bleeding admitted uring 1962-67, 71 were due to esophageal varices resulting om cirrhosis and portal hypertension; all these were initially eated by esophageal compression using a double-balloon cathe- er. Subsequently, 20 of these 71 patients were treated con- ervatively (10 of these 20 died), 20 were treated by local pal- ative surgery (the ligation or bisection procedures of ossschulte, Linton and Tanner), which resulted in 18 deaths, nd 31 (18 men and 13 women, average age 57 yr and including 3 over the age of 60) were subjected to emergency portacaval unt surgery. All 31 survived the operative period, but 16 ncluding 13 of the 22 with ascites) died later, due mostly (10 ases) to recurrent bleeding and resultant shock; there were 5 elatively early deaths due to aspiration pneumonia and res- iratory insufficiency, and 1 case in which hepatic insufficiency as the first complication. The anastomosis itself remained pa- ent in all cases, and all showed significant decreases in portal ressure. Recurrent bleeding was noted at one time or another 14 of the 16 fatal cases and in 6 of the 15 survivors (one of hom had 2 such episodes); the prevention of such recurrences considered to be the most important step in any effort to educe the mortality from portacaval shunt surgery. After a ollow-up of 4-55 months, only one of the survivors had died hepatic coma at 4 months), although 4 others were in poor eneral condition. Splenoportography is recommended as a ay of confirming the diagnosis and simultaneously determin- ng the adequacy of the portal and hepatic circulation. It is lso mentioned that among 135 other patients who were treated or portal hypertension during the period 1962-67, 54 were iven elective portacaval shunts during intervals between attacks f bleeding (only 7 of these 54 died), and 10 more without any istory of bleeding were given prophylactic shunts.

2067 CANCER OF THE ESOPHAGUS DEVELOPING IN CICATRICIAL STENOSES DUE TO BURNS. *Rus.)* Sytnik, A. P. (N. V. Sklifosovskii Inst. First Aid Res., Moscow, USSR) and B. A. Petrov. *Khirurgiia (Moskva)* 44(11): 3-9, 1968.

Fourteen patients (5 men and 9 women, average age 40 yr) with cancer of the esophagus developing in chemical burn scars were observed during the 13-yr period 1953-67. The time between original injury and the development of cancer was 16-41 yr (average 26 yr); the development of a malignant process was signalled by increasing dysphagia and finally diagnosed by esophagoscopy and biopsy. Only 4 patients were admitted in sufficiently early stages of cancer to be treated surgically, and 1 of these refused surgery; the other 3 were treated by the Dobromyslov-Torek procedure followed by retrosternal esophagoplasty (using the right colon and a segment of small intestine) in 3-8 months. One of these 3 was operated on too recently for follow-up, but of the other 2, one appears healthy at 2.5 yr while the other died of metastatic cancer over 4 yr postoperatively. Of 10 patients in late stages at time of diagnosis, 8 died in 1-2 months and 2 were successfully treated by radiation followed by gastrostomy for feeding purposes. In view of the danger of tumor development, it is concluded that the indications for esophagoplasty after chemical burns should be enlarged, especially when repeated bougienage is ineffective. The importance of complete excision of a cicatricial area is emphasized.

2068 CONGENITAL POSTEROLATERAL DIAPHRAGMATIC HERNIAS THROUGH THE FORAMEN OF BOCHIDALEK: REPORT OF FOUR CASES. *(Gr.)* Kourias, V. and A. Agorogiannis. *Acta Chir Hellen* 95(5):774-788, 1968.

2069 UNUSUAL TYPES OF CONGENITAL DIAPHRAGMATIC HERNIA: 1) SUBCOSTOSTERNAL (MORGAGNI) AND 2) POSTEROLATERAL (BOCHDALEK). *(Gr.)* Mavrantonis, S., K. Theodosopoulos, D. Lourantos and S. Dendrinos. *Acta Chir Hellen* 95(5):709-717, 1968.

2070 A CASE OF SCLERODERMA ACCOMPANIED BY EXTREME DYSPHAGIA. *(Turk.)* Minkari, T. (Fac. Surg. Med., U. Istanbul, Turkey). *Turk Tip Cem Mec* 34(5):336-340, 1968.

2071 CASE REPORT OF A FOREIGN BODY WHICH REMAINED INSIDE THE LUMEN OF THE ESOPHAGUS FOR FOUR YEARS. *(Turk.)* Minkari, T. (Fac. Surg. Med., U. Istanbul, Turkey), M. Tanker and K. Alemdaroglu. *Turk Tip Cem Mec* 34(7):434-437, 1968.

2072 DIAPHRAGMATIC HERNIA OF THE MORGAGNI TYPE. *(Gr.)* Dontas, N., N. Anezyris, N. Sekouris and P. Katsiotis. *Acta Chir Hellen* 95(4):623-628, 1968.

2073 DIAGNOSIS AND TREATMENT OF AN ESOPHAGEAL STRICTURE (RING) IN A PATIENT WITH BARRETT'S EPITHELIUM. *(E.)* Jordan, P. H. (Baylor U. Coll. Med., Dallas, Texas) and E. H. Longhi. *Ann Surg* 169(3):355-363, 1969.

2074 THE LEWIS-TANNER OPERATION FOR CANCER OF THE OESOPHAGUS. *(E.)* Ong, G. B. (Dept. Surg., U. Hong Kong) and K. H. Kwong. *J Roy Coll Surg Edinb* 14(1):3-19, 1969.

2075 ANGIOMUSCULAR OCCLUSION DUE TO TRACTION ON THE TERMINAL ESOPHAGUS AND ITS CLINICAL SIGNIFICANCE. *(Fr.)* Stelzner, F. (Surg. Clin., U. Hamburg-Eppendorf, Germany). *Actualites Hepatogastroent Hotel Dieu* 4(4):B165-B171, 1968.

2076 VOMITING DUE TO ESOPHAGOCARDIOFUNDAL OR DIAPHRAGMATIC ANOMALIES. *(Fr.)* Borde, J. (U. Hosp. Ctr., Rouen, France). *Rev Prat* 19(1):17-24, 1969.

2077 MODIFICATION OF THE TRANSTHORACIC DISSECTION OF THE ESOPHAGUS. *(Ger.)*

Wenzl, M. (Sophie Hosp., Vienna, Austria). *Thoraxchirurgie* 16(6):506, 1968.

2078 TREATMENT OF ESOPHAGEAL PERFORATIONS. *(Ger.)* Konrad, R. M. (Surg. Clin., U. Düsseldorf, Germany). *Thoraxchirurgie* 16(6):492-499, 1968.

2079 A SINGLE CASE OF CONGENITAL STENOSIS OF THE ESOPHAGUS. *(It.)* Rosa, G. (Inst. Gen. Surg. Clin., U. Padua, Italy). *Acta Chir Ital* 24(4):383-391, 1968.

2080 CARDIOSPASM OR ACHALASIA AND MEGAESOPHAGUS IN CHILDREN. *(Ger.)* Schumann, R. (Munic. Clin., Berlin-Buch, Germany). *Z Kinderchir* 6(3): 292-302, 1968.

2081 SURGICAL AND RADIATION TREATMENT OF CANCER OF THE THORACIC ESOPHAGUS. *(E.)* Goodner, J. T. (Mem. Hosp., New York, N. Y.). *Amer J Roentgen* 105(3):523-528, 1969.

2082 SOME OPINIONS ON TREATMENT OF CANCER OF THE ESOPHAGUS. *(E.)* Rider, W. D. (Princess Margaret Hosp., Toronto, Canada) and R. D. Mendoza. *Amer J Roentgen* 105(3):514-517, 1969.

2083 THE VALUE OF RADIOTHERAPY IN THE MANAGEMENT OF ESOPHAGEAL CANCER. *(E.)* Pearson, J. G. (Dept. Radiotherapy, U. Edinburgh, Scotland). *Amer J Roentgen* 105(3):500-513, 1969.

2084 TREATMENT OF POST-OPERATIVE ESOPHAGEAL STRICTURE BY DILATATION WITH METAL OLIVE BOUGIES. *(E.)* Rider, J. A. (Franklin Hosp., San Francisco, Calif.), H. C. Moeller, E. J. Puletti and D. C. Desai. *Gastroint Endosc* 15(3):151-155, 1969.

2085 DOSIMETRIC CONSIDERATIONS IN COBALT 60 ROTATIONAL THERAPY FOR ESOPHAGEAL LESIONS: A COMPARISON OF TRANSIT AND INTRALUMINAL DOSE MEASUREMENT. *(E.)* Goldenberg, D. B. (Johns Hopkins Hosp., Baltimore, Md.), U. V. Gopala, S. Lott and J. Digel. *Amer J Roentgen* 105(3):518-522, 1969.

2086 INTERIM PROSTHETIC MANAGEMENT OF PHARYNGOSTOMA AND ESOPHAGOSTOMA. *(E.)* Argerakis, G. P. and J. B. Lepley. *Surg Clin N Amer* 49(2):285-290, 1969.

2087 DETERMINATION OF TUMOR DOSE BY TRANSMISSION MEASUREMENTS IN ROENTGEN ROTATION TREATMENT OF THE ESOPHAGUS. *(E.)* Nordberg, U. B. (Dept. Radiat. Phys., U. Lund, Sweden). *Acta Radiol* 7(6):401-406, 1968.

2088 SPONTANEOUS RUPTURE OF THE ESOPHAGUS. [CASE REPORT] *(E.)* Lerner, H. J. (Pennsylvania Hosp., Philadelphia). *Amer Surg* 35(4):237-240, 1969.

2089 SPONTANEOUS RUPTURE OF THE ESOPHAGUS. REPORT OF A CASE. *(E.)* Smulewicz, J. J. (Long Island Jewish Hosp., Jamaica, N. Y.), A. Kovac and H. Gamponis. *Amer J Gastroent* 51(4):317-321, 1969.

2090 ESOPHAGEAL HIATUS HERNIA. *(Por.)* Paulin F. *Rev Brasil Cir* 56(7/8):261-266, 1968.

2091 ESOPHAGOHEPATIC FISTULA. *(Sp.)* Arzúa Zulaica, E., J. M. Barbier Puyo and J. D. Toledo Ugarte. *Rev Clin Esp* 111(3):319-322, 1968.

2092 LEIOMYOSARCOMA OF THE ESOPHAGUS: PRESENTATION OF A CASE. *(Sp.)* Otera, G. O. (Fac. Med. Sci., Natl. U. Cuyo, Mendoza, Argentina) and M. T. Tano Assini. *Rev Esp Enferm Apar Dig* 28(3):381-388, 1969.

2093 ATYPICAL RADIOLOGICAL PICTURES OF THI TERMINAL ESOPHAGUS. *(It.)* Timossi, G. (Gen. Hosp., Fiorenzuola d'Arda, Italy) and S. Silva. *Minerva Gastroent* 14(4):224-229, 1968.

2094 SPONTANEOUS RUPTURE OF THE ESOPHAGUS. *(Dan.)* Blichert-Toft, M. (Cent. Hosp., Naestved, Denmark) and H. K. Jensen. *Ugeskr Laeg* 131(4): 142-143, 1969.

2095 SIDE TO SIDE ESOPHAGEAL ANASTOMOSIS. *(Rus.)* Seit-Umerov, S. M. (Vladivostok Med. Inst., USSR). *Khirurgiia (Moskva)* 44(12):27-30, 1968.

2096 RADIOLOGICAL STUDY OF HIATUS HERNIA IN THE ADULT. *(Sp.)* Zulaica, E. de A. (Bilbao Spain). *Rev Esp Enferm Apar Dig* 27(9):1289-1305, 1968.

See also 2007,2029,2112,2119,2124,2212,2477

STOMACH

(Gastric ulcer is placed with peptic ulcer)

97 RESULTS OF GASTRIC BIOPSIES IN LIVER DISEASES. *(Ger.)* Seifert, E. (Hanusch Hosp., enna, Austria). *Med Welt* 20(8):397-400, 1969.

aterial for histological study was obtained by aspiration opsy of the stomachs of 163 patients with histologically conmed liver disease and 68 patients with histologically normal ers. Subjects in these 2 groups were of approximately the me age. Patients with liver disease included 74 with cirrhosis, with acute and 16 with chronic hepatitis, 53 with fatty liver, d 15 with other liver diseases. The cause of liver disease was ronic alcoholism in 57 cases, diabetes mellitus in 39, and patitis in 41. Atrophic changes in the gastric mucosa apared more frequently among cirrhotics and alcoholics than nong controls. Mild and moderate superficial gastritis ocrred more frequently among patients with a history of hepatis and diabetes than among those with cirrhosis. Severe perficial gastritis was more common among controls than nong cirrhotics. Initial signs of mucosal atrophy were found ost often in patients with fatty liver, while complete mucosal rophy was found most often in controls and patients with abetes. However, none of these differences were statistically gnificant.

098 OUR EXPERIENCE WITH THE USE OF GASTRIC HYPOTHERMIA. A CLINICAL CONSIERATION OF 98 CASES. *(It.)* Giombolini, R. (Munic. osp., Foligno, Italy) and C. Leo. *Arch Ital Chir* 94(3):447-53, 1968.

astric freezing was used in the treatment of 79 patients with onstenotic duodenal ulcers, 11 with gastroduodenitis, 1 with gastric ulcer, and 4 with anastomotic peptic ulcers. All 95 atients were treated only once for 45 min with a Swenko pparatus in which 95% alcohol was circulated at temperatures etween -10 and -16C. Best results were obtained without the se of drugs. Freezing caused no complications but did reduce astrointestinal motility slightly and produced "post-freezing yndrome" in about 40% for the first 15-20 days after treatnent. No gross or microscopic changes were found in the valls of the stomach in 11 patients who later underwent surgery. ollow-ups were made for 12-18 months on 65 patients. Reults were satisfactory in 58.4% and poor or unsatisfactory in 1.6%. Surgery was performed on 11 of 12 patients whose ondition deteriorated. Three patients with gastrointestinal leeding due to gastric ulcers (2 cases) or esophageal varices 1 case) were treated once or twice for 3-12 hr per session at emperatures of +3 to +5C. Two of these patients died, one of cardiorespiratory failure and the other of hepatorenal failure.

2099 EMERGENCY TREATMENT OF CHEMICAL BURNS OF THE STOMACH CAUSED BY SWALLOWING STRONG ACID. EXPERIMENTAL STUDY. *Fr.)* Desoille, H. (Fac. Med., Paris, France), L. Truffert, P. Delavierre, C. Girard-Wallon and G. Cremer. *Sem Hop Paris* 45(12):759-767, 1969.

Since preliminary *in vitro* studies showed that triethanolamine which has been partially neutralized with citric acid is a good neutralizing agent, 3 groups of guinea pigs were given through a stomach tube: 1) 0.5-10% solutions of sulfuric acid, 2) solutions containing 0.55-5.5 g/100 ml of citric acid and 2.57-25.7 g/100 ml of triethanolamine, and 3) sulfuric acid followed by triethanolamine citrate. Ingestion of 0.1-2.7% solutions of sulfuric acid produced no gross changes in the stomach mucosa, but in some animals 2.65 and 2.7% solutions produced a blackish fluid in the stomach, mucosal congestion and necrosis, and perforation. Lesions were more severe and perforation occurred in larger numbers of animals with higher concentrations of sulfuric acid. Only the most concentrated solution of triethanolamine citrate produced slight changes in the gastric mucosa of 3 animals. Lesions produced by low concentrations of acid were not found if triethanolamine was administered within 4 min after ingestion of acid. The neutralizing agent reduced the corrosive action of 4.1 and 5.4% solutions and prevented perforation and reduced the severity of lesions produced by higher concentrations if administered within 4 min after ingestion of acid.

2100 PERSONAL OBSERVATIONS ON CANCER OF THE STOMACH. *(Pol.)* Czarnecka-Rybarz, H. (Prov. Hosp., Opole, Poland). *Wiad Lek* 21(21):1893-1899, 1968.

The 10,523 patients admitted to the Provincial Hospital at Opole during the 10-yr period 1957-66 included 82 cases (58 males and 24 females) of gastric cancer, representing 36% of all cancers seen during that period. Most of these 82 patients were 50-70 yr old, with an average age of 58 yr for the men and 61 yr for the women. Since 54.9% did not smoke and 56.1% did not drink, tobacco and alcohol are not thought to play an etiological role; 51.5% belonged to blood group A. The principal symptoms were epigastric pain, loss of appetite and weight loss, lasting for 3 months or less before admission in 42.7%, for 4-12 months in 29.2%, and for 1 yr or more in 28.1%. Hypochlorhydria was noted in 83.8% and an elevated erythrocyte sedimentation rate in 68.3%. Surgery was still possible in only 27 cases, and was performed in only 13, of whom 8 died postoperatively; 84.5% of the entire group of patients died in the hospital without recovery.

2101 THE CONTENT OF CREATINE AND PHOSPHORUS IN THE STRIATED MUSCLES IN PATIENTS WITH CANCER OF THE STOMACH OR GASTRODUODENAL ULCERS. *(Pol.)* Oszacki, J. (Inst. Oncol., Krakow, Poland), O. Gedliczka, A. Marczynska, B. Adamczyk and J. Kulpa. *Nowotwory* 18(4):321-325, 1968.

Comparative studies of the creatine and phosphate levels in the striated musculature of 22 patients with stomach cancer, 14 patients with gastric ulcers, 20 patients with duodenal ulcers and 12 controls revealed no significant differences between the 4 groups in creatine levels (varying from 2.82 g/kg in controls to 3.15 g/kg in patients with stomach cancer). Phosphorus levels, however, were significantly increased in patients with all 3 diseases, being 3.10 g/kg in those with duodenal ulcers, 2.85 g/kg in those with stomach ulcers, and 2.64 g/kg in those with stomach cancer compared to 2.10 g/kg in controls.

2102 THE SURGICAL TREATMENT OF FUNCTIONAL DISTURBANCES FOLLOWING BILLROTH II GASTRECTOMY: REPORT OF 17 CASES.

(Fr.) Adloff, M. (U. Hosp. Ctr., Strasbourg, France) and J. J. Kohler. *Cah Coll Med Hop Paris* 10(2):111-117, 1969.

Among 17 patients (16 men and 1 woman, 30-63 yr old) presenting with severe postgastrectomy syndromes (dumping in 12, malnutrition in 4, afferent loop syndrome in 1), 2 were treated by transformation of the Polya into a Pean gastrectomy (degastrogastrectomy followed by a side-to-end gastroduodenostomy) and 15 were treated by the method of Soupault (transposition of the efferent loop to the duodenum). The initial gastrectomy had been performed for peptic ulcer (gastric in 4 cases, duodenal in 13) some 1-21 yr before (2-10 yr in most cases). Results were excellent in 8 of those treated by the technique of Soupault, good in 1 of these and in the 2 patients in whom the Billroth II was converted into a Billroth I, and fair-poor in 3 others; one patient was lost to follow-up and 2 died. Transposition of the efferent loop to the duodenum is concluded to be a logical and simple method for the treatment of serious postgastrectomy syndromes. However, the indications for surgery should be carefully defined, the most common being the dumping syndrome but the most urgent being dietary deficiencies and weight loss due to malabsorption. The afferent loop syndrome is also alleviated by this procedure. Despite the fact that no ulcers have been observed following the Soupault procedure, vagotomy (performed in only one of the 15 cases) is recommended whenever there is residual gastric acidity. Various other techniques for the surgical treatment of postgastrectomy syndromes are described and reviewed.

2103 PERSONAL EXPERIENCE WITH TOMODA'S GASTROPLASTY TECHNIQUE IN 31 CASES.

(Sp.) Narbona Arnau, B. (Prov. Hosp., Valencia, Spain). *Cir Ginec Urol* 22(5):571-577, 1968.

In 31 patients subjected to total or near-total (80-90%) gastrectomy for stomach cancer (12 men and 5 women, 51-67 yr old), combined duodenal and high-gastric ulcers (10 men and 1 woman) or the Zollinger-Ellison syndrome (3 cases), the stomach was replaced by an integral loop of ascending jejunum according to a modification of the technique of Masanobu Tomoda of Fukuoka. In this modification, 2 ligatures are used rather than only one and an "omega" anastomosis is constructed between the 2 segments of the ascending jejunum. The results were excellent, with practically no postgastrectomy symptoms. The mortality rate was only 3.2% (death in one 67-yr-old woman treated for gastric cancer).

2104 ELECTROGASTROGRAPHIC AND ROENTGENOLOGICAL PARALLELS IN PATIENTS SUBJECTED TO RESECTION OF THE GASTRIC CARDIA FOR CANCER.

(Rus.) Zheleznyi, V. I. (Nagatinsk Line Hosp. Water-Transport Workers, Moscow-Oka-Volga Waterways, USSR). *Khirurgiia (Moskva)* 44(11):36-40, 1968.

The evacuatory function of the gastric stump was studied electrogastrographically and by X-ray in 40 patients subjected to resection of the cardia for cancer 10 days to 16 yr before. In the early periods after cardiectomy, the motor function of the gastric stump was sharply reduced, resulting in accelerated gastric emptying. With increasing time since the operation, the motor function of the stump improved, manifested in the electrogastrogram by an increase in amplitude and frequency of the bipotentials, particularly after ingestion of a test meal (150 ml of sweet tea and 150 g of white bread). In most cases improvement set in 7-8 months postoperatively, but in one third of the patients improvement was delayed to 2-3 yr. Differences in the electrogastrograms were also shown by the 2 groups of patients which could be divided on the basis of the type of postprandial pain. In patients with the dumping syndrome, the gastric biopotentials were 2-3 times as high as normal.

2105 THE CAUSES OF FAILURE IN THE SURGICAL TREATMENT OF STOMACH CANCER. *(Rus.)*

Zybina, M. A. (Krivorog Munic. Oncol. Clin., USSR). *Khirurgiia (Moskva)* 44(11):20-23, 1968.

Among 150 patients treated for stomach cancer during 1964 and 1965, 95 showed involvement of the serosa, of whom 91 were operated; penetration into the serosa was confirmed histologically in 43 of these cases. The main factor determining serosal involvement was found to be the anatomical type of the tumor, since such involvement was noted in 50% of those with polypoid tumors, 67% of those with patelliform tumors, and 89.2% of those with diffuse-infiltrative cancers. Five types of serosal involvement could be distinguished macroscopically, ranging from small nodules to massive growth through the stomach wall. Patients with tumors involving the serosa did not differ from other patients with stomach cancer in clinical symptoms. However, they were much less commonly operable (50% compared to 75%), multiple metastases to the regional lymph nodes were seen twice as often, cancer cells penetrated to the surface of the stomach in 66.3% and into the abdominal cavity in 50%, and 86.3% showed intraperitoneal metastases compared to 63.6% in other patients. Among patients in whom tumor cells were found in the abdominal cavity during radical surgery, 65.4% survived 1 yr postoperatively compared to 89.2% of patients without intraabdominal tumor cells.

2106 GASTRIC MUCOSAL HEMORRHAGE IN DOGS. EFFECTS OF ACID, ASPIRIN, AND ALCOHOL.

(E.) Davenport, H. W. (Dept. Physiol., U. Michigan, Ann Arbor). *Gastroenterology* 56(3):439-449, 1969.

The effects of acid, acetylsalicylic acid (aspirin), and ethanol in damaging the gastric mucosa, and in particular in causing hemorrhage, were studied by irrigating pouches of the oxyntic glandular area of the dog's stomach with solutions containing 54 mn NaCl and combinations of acid (0, 1, 10, or 100 mn HCl), aspirin (0, 5, 10, or 20 mM) and ethanol (0, 4 to 5, or 8 to 10% w/v). Zero acidity (pH 6.2 to 7.4) was achieved using either citrate or Tris buffer; the results were the same with either buffer. Rates of absorption of aspirin and ethanol were measured, and the rate of absorption of one was found to be entirely independent of the other. Net Na$^+$ and H$^+$ fluxes during subsequent irrigation with 100 mN HCl plus 54 mN NaCl were measured and compared with fluxes observed during control periods to assess changes in the gastric mucosal barrier. Rate of bleeding was measured by hemoglobin output. The mucosa never bled during irrigation with aspirin in neutral solutions with or without ethanol, nor did it bleed when it was subsequently irrigated with 100 mN HCl. Irrigation with 20 mM aspirin in 1 or 10 mN HCl, with or without ethanol, alway damaged the gastric mucosal barrier as shown by increased net Na$^+$ fluxes. The mucosa did not bleed during irrigation with these solutions, but it usually bled when subsequently irrigated ith 100 mN HCl or when it was stimulated to secrete by inection of histamine or bethanechol chloride. Severe damage nd brisk bleeding were always produced by the combination f 20 mM aspirin, 100 mN HCl, and 8 to 10% ethanol. Soluions containing 4 to 5% ethanol; 10 or 20 mM aspirin; and 1, 0, or 100 mN HCl were more damaging than the correspondng solutions containing no ethanol. The threshold concentraion of acid required to produce bleeding after exposure of he mucosa to aspirin, acid, and alcohol was determined by rrigating the mucosa first with 20 mM aspirin in 10 mN HCl nd 8 to 10% ethanol and then with 10, 25, 40, or 65 mN ICl. The acid threshold for bleeding lay between 25 and 65 nN HCl. Irrigation of bleeding pouches with either citrater Tris-buffered neutral solutions nearly always resulted in essation of bleeding within 75 min, and recovery from bleedng was the same whether or not the neutral solutions contained 0 mM aspirin.

107 MILK INTOLERANCE FOLLOWING GASTRIC SURGERY. *(E.)* Gudmand-Hoyer, E. Rigshospitalet, Copenhagen, Denmark) and S. Jarnum. *Scand Gastroent* 4(2):127-132, 1969.

mong 95 patients (29 men and 66 women) operated on for eptic ulcer, milk intolerance (abdominal symptoms following he ingestion of milk) was present in 35 patients (37%). Lacose malabsorption was found in 7 cases. The incidence of nilk intolerance was about twice as high among patients operated with a Billroth II resection as among patients operated vith a Billroth I resection or a vagotomy + pyloroplastic proedure. In 20% of patients with chronic diarrhea, the diarrhea ould be ascribed to lactose malabsorption. During sugar tolrance tests, 70% of all patients developed abdominal symptoms. There was no significant difference between the symptoms luring lactose tolerance test and glucose-galactose tolerance est.

2108 POST-GASTRECTOMY ANEMIA. [EDITORIAL] *(E.)* Demole, M. (Geneva, Switzerland). *Digestion* 1(6):370-374, 1968.

2109 DISTURBANCES OF THE SECRETION OF CASTLE'S INTRINSIC FACTOR IN CLINICAL DISEASES OF THE STOMACH. *(Rus.)* Geller, L. I. (Khabarovsk Med. Inst., USSR). *Ter Arkh* 40(10):11-15, 1968.

2110 NEURINOMA OF THE STOMACH. *(Ser.)* Dedić, M. (Gen. Hosp., Sombor, Yugoslavia) and F. Ambrošić. *Med Pregl* 21(9/10):363-368, 1968.

2111 A CASE OF SEVERE GASTROPLEGIA FOLLOWING A CHOLECYSTECTOMY AND REVISION OF A GASTROENTEROSTOMY MADE TWO YEARS BEFORE ALONG WITH A VAGOTOMY. *(Fr.)* Debesse and Chardac. *Mem Acad Chir (Paris)* 94(29):857-858, 1968.

2112 A CASE OF GASTROPLEGIA AFTER SURGERY FOR A HIATUS HERNIA. *(Fr.)* Elbim, A. *Mem Acad Chir (Paris)* 94(29):856, 1968.

2113 TREATMENT AND PREVENTION OF ACUTE GASTROPLEGIA AFTER VAGOTOMY. *(Fr.)* Henrion, C. *Mem Acad Chir (Paris)* 94(29):851-856, 1968.

2114 ULCERATION OF INTRAMURAL GASTRIC NEOPLASMS. [TWO CASES] *(E.)* Siegelman, S. S. (Montefiore Hosp., Bronx, N. Y.), J. A. Gold, M. Simon and I. Soifer. *Amer J Dig Dis* 14(2):127-134, 1969.

2115 GENEROUS EXPLORATORY GASTROTOMY IN THE CONTROL OF GASTRODUODENAL HEMORRHAGE. *(E.)* Herrington, J. L. Jr. (Nashville, Tenn.). *Surg Gynec Obstet* 128(3):600-602, 1969.

2116 THE ADVANTAGES OF DRAINING A DIFFICULT CLOSURE OF THE DUODENAL STUMP BY AN ISOLATED JEJUNAL LOOP AFTER TOTAL GASTRECTOMY FOR STOMACH CANCER: REPORT OF A CASE. *(Gr.)* Khrysospathis, P., N. Kampanis and N. Kharitopoulos. *Acta Chir Hellen* 95(4):574-579, 1968.

2117 THE TREATMENT OF HYPOCHLORHYDRIA AND ACHLORHYDRIA WITH ROERISAN. *(Ger.)* Tabatabai, A. (2nd Red Cross Hosp., Munich, Germany). *Med Welt* 19(45):2496-2497, 1968.

2118 MODERN DIET THERAPY IN THE TREATMENT OF STOMACH DISEASES. *(Ger.)* Nicolay, K. (Franziskus Hosp., Hardenberg-Neviges, Germany). *Landarzt* 44(33):1625-1629, 1968.

2119 A COMMENT ON THE REPORT OF MR. THOMERET AND MR. BAY ON A CASE OF SEVERE GASTROPLEGIA AFTER SURGERY FOR HIATUS HERNIA. *(Fr.)* René, L. *Mem Acad Chir (Paris)* 94(29):858, 1968.

2120 POSTOPERATIVE GASTROPLEGIA. *(Fr.)* Mialaret, J. *Mem Acad Chir (Paris)* 94(29):859, 1968.

2121 RADIOLOGICAL FINDINGS IN SIXTEEN CASES OF GASTRIC DIVERTICULA. *(Jap.)* Yoshinari, T. (Yoshinari Clin. Gastroent., Tokushima, Japan). *Shikoku Act Med* 24(5):553-559, 1968.

2122 AUTOIMMUNE PHENOMENA IN PERNICIOUS ANEMIA AND CHRONIC ATROPHIC GASTRITIS. *(Ger.)* Hartl, W. (Med. Clin., U. Tübingen, Germany) and E. Genth. *Verh Deutsch Ges Inn Med* 74:773-777, 1968.

2123 GLOMUS TUMOR OF THE STOMACH. REPORT OF A CASE AND REVIEW OF THE LITERATURE. *(E.)* Weitzner, S. (VA Hosp., Albuquerque, N. M.). *Amer J Gastroent* 51(4):322-328, 1969.

2124 PREVENTION OF REFLUX ESOPHAGITIS FOLLOWING GASTRECTOMY BY MEANS OF AN INVAGINATING VALVE ENTEROANASTOMOSIS. *(Rus.)* Burtsev, A. N. (Donetsk Med. Inst., USSR). *Klin Khir (Kiev)* (10):37-40, 1968.

2125 DISTURBANCES IN PROTEIN METABOLISM AFTER GASTRECTOMY. *(Rus.)* Vasilenko, V. Kh., M. A. Vinogradova and L. N. Karmazina. *Klin Med (Moskva)* 47(2):20-31, 1969.

2126 **LYMPHOSARCOMA OF THE STOMACH: PATHOLOGICAL DATA.** *(It.)* Rumpianesi, G. (Inst. Clin. Gen. Med., U. Bologna, Italy). *Clinica (Bologna)* 28(1):16-33, 1968.

2127 **BLEEDING FROM THE STOMACH DURING DIABETIC COMA.** *(Rus.)* Tal'nishnikh, A. Ia. (Rostov-on-Don Med. Inst., USSR) and M. S. Soboleva. *Klin Med (Moskva)* 49(11):105-107, 1968.

2128 **LEIOMYOMA OF THE STOMACH.** *(Sp.)* Andreu Kern, F. (Virgen del Rocio Soc. Secur., Seville, Spain) and E. Torres R. De Torres. *Rev Esp Enferm Apar Dig* 28(3):389-396, 1969.

2129 **CLINICAL SYMPTOMS OF NEURINOMA OF GASTRIC TUMORS.** *(Ger.)* Gregl, A. (Surg. Clin., U. Göttingen, Germany), H. Niemann, and J. Schlachetzki. *Bruns Beitr Klin Chir* 216(7):640-643, 1968.

2130 **CORRECTING WATER-ELECTROLYTE METABOLISM DISTURBANCES IN SURGICAL INTERVENTIONS ON THE STOMACH.** *(Rus.)* Druianov, B. M. (N. A. Semashko Cent. Clin. Hosp., Moscow, USSR). *Khirurgiia (Moskva)* 45(1):94-99, 1969.

2131 **ANTROPYLORIC FIBROMYOMATOSES IN THE ADULT.** *(Fr.)* Loygue, J. (Rothschild Hosp., Paris, France) and C. Huguet. *Acta Chir Belg* 67(9):926-938, 1968.

2132 **EOSINOPHILIC GRANULOMA OF THE STOMACH.** *(It.)* Stefanoni, G. (San Carlo Borromeo Greater Hosp., Milan, Italy) and G. Frascolla. *Minverva Chir* 24(3):169-176, 1969.

2133 **A CASE OF RETICULUM CELL SARCOMA OF THE STOMACH.** *(Jap.)* Sakamoto, A. (Tosei Natl. Hosp., Shizuoka, Japan), K. Hatada and J. Tanaka. *Iryo* 22(11):1347-1351, 1968.

2134 **GASTRIC LEIOMYOSARCOMA: A CASE DIAGNOSED WITH SELECTIVE CELIAC ARTERIOGRAPHY BY SELDINGER'S METHOD.** *(Jap.)* Kato, M. (Kure Natl. Hosp., Hiroshima, Japan), T. Jyo, T. Mori, T. Nakagawa, M. Fujino, H. Taniguchi, K. Onoda, S. Kobayashi and H. Sakihara. *Iryo* 22(11):1342-1346, 1968.

2135 **X-RAY FINDINGS IN BRIDGING FOLDS OF SUBMUCOSAL TUMORS AND PEDUNCLES OF POLYPS.** *(Jap.)* Sasaki, K. (Fukuoka-Chuo Natl. Hosp., Japan), M. Koga, H. Nakata, K. Kendo, K. Baba, H. Ueno, T. Yao, T. Takihara, R. Matsuura, S. Onishi, M. Obata and H. Sakamoto. *Iryo* 22(11):1320-1328, 1968.

2136 **PRE- AND POST-OPERATIVE CARE OF CONGENITAL HYPERTROPHIC PYLORIC STENOSIS.** *(Jap.)* Yokoyama, J. (Child. Natl. Hosp., Tokyo, Japan), H. Akiyama and T. Denda. *Iryo* 22(11):1241-1250, 1968.

2137 **USING A MECHANICAL SUTURING DEVICE IN GASTROSTOMIES ACCORDING TO JIANU.** *(Rus.)* Kogan, A. S. (Novosibirsk Med. Inst., USSR). *Khirurgiia (Moskva)* 45(1):128-129, 1969.

2138 **THE SIGNIFICANCE OF GASTRECTOMY TECHNIQUE IN PREVENTING THE DUMPING SYNDROME.** *(Rus.)* Myshkin, K. I. (Saratov Med. Inst., USSR), B. V. Krapivin, A. N. Chernomashentsev and Yu. A. Yartsev. *Khirurgiia (Moskva)* 45(1):21-25, 1969.

2139 **STOMACH RESECTION WITH THE CREATION OF A GASTRODUODENAL TERMINOLATERAL ANASTOMOSIS.** *(Rus.)* Chikov, A. I. (3rd Munic. Hosp., Nikolaev, USSR). *Khirurgiia (Moskva)* 44(12):49-54, 1968.

2140 **PYLORIC SPASMS.** *(Sp.)* Fraga, F. (Santa Teresa Hosp., Rio de Janeiro, Brazil) and M. Martins. *Folha Med* 57(4):65-73, 1968.

2141 **GASTROSTOMY IN ABDOMINAL SURGERY.** *(Sp.)* Sans, J. V. (Fac. Med., U. Barcelona, Spain). *Rev Esp Enferm Apar Dig* 27(9):1306-1312, 1968.

2142 **CONGENITAL PYLORIC ATRESIA.** *(Ger.)* Sailer, R. (Surg. Clin., U. Ruhr, Germany) and E. Müller. *Kinder Chir* 6(3):328-333, 1968.

See also 1819,1884,1934,2005,2013,2015,2029,2031,2055,2147,2182,2183,2185,2188,2190,2194,2196,2197,2208,2224, 2343,2528

SMALL INTESTINE

2143 **DYNAMICS OF MORPHOLOGICAL CHANGES IN THE WALL OF THE SMALL INTESTINE FOLLOWING ITS TEMPORARY EXCLUSION FROM THE CIRCULATION.** *(Rus.)* Shalygina, N. B. (Inst. Nutrit., Acad. Med. Sci. USSR, Moscow) and V. P. Kulik. *Eksp Khir Anest* 13(6):17-22, 1968.

To simulate conditions occurring during transplantation of the small intestine, circulation through the small intestine was stopped for 40 min in 11 dogs by clamping off the main mesenteric vessels below the site where they leave the ileocolic artery, the arcade vessels, and the entire small intestine from beginning to end. Biopsies were taken about 30 cm from the plica duodenojejunalis. Destructive changes were most evident in the mucosa where edema of the basal part of the epithelial cytoplasm was noted immediately after restoration of the circulation. This was followed, 2-3 days later, by necrosis and desquamation. Changes were most severe in the villi, while the crypts remained intact. However, a considerable decrease in cytoplasmic RNA occurred in the cryptal epithelium during the first 5 days and mucus production decreased between the 2nd and 5th days. Mitotic activity increased in the crypts, even in their upper parts. Intramural nerve plexi remained with decreases in RNA occurring only in the neurons of Auerbach's plexus the day after surgery. Subsequent increases in RNA are attributed to increased intestinal motility. No histological or functional abnormalities were found in the small intestine 14 days after surgery.

2144 **DOES ALCOHOL CAUSE DUODENITIS?** *(E.)* Pirola, R. C. (Prince Henry Hosp., Little Bay, N.S.W., Australia), T. D. Bolin and A. E. Davis. *Amer J Dig Dis* 14(4):239-244, 1969.

Peroral duodenal biopsies were taken from 6 chronic alcoholics (590 g alcohol/day average) and examined for infiltration by inflammatory cells and vascularization of the mucosa to determine the presence of duodenitis. In addition, specimens were taken from the duodenum, ileum and jejunum of 24 male Wistar rats (12 were given 15% alcohol for 30 days and 30% alcohol for 70 days, and 12 were used as controls). The rat specimens were examined histologically and their leucine aminopeptidase and disaccharidase activities were determined. The appearance and activity of all duodenal specimens were normal and no evidence of duodenitis was found.

2145 **STENOSIS NEAR THE LIGAMENT OF TREITZ.** *(Ger.)* Kern, E. (Munic. Hosp., Lörrach, Germany) and H. Gropp. *Chirurg* 40(3):126-128, 1969.

Case reports are presented for 8 patients with duodenal obstructions near the suspensory muscle (ligament of Treitz). They included an 18-yr-old girl with membranous stenosis in the inferior part of the duodenum and stenosis in the duodenojejunal flexure produced by mesenteric blood vessels. Three infants had 1) a perforated Meckel's diverticulum and ileus caused by adhesions just below the suspensory muscle, 2) kinking of the upper loop of the small intestine which produced stenosis at the suspensory muscle, and 3) volvulus of the entire small intestine which was rotated 360° clockwise around the mesentery and a mobile cecum. One of these infants died of a liver abscess 22 days after surgery. Other causes of obstruction included a large mesenteric cyst, a carcinoma of the small intestine, metastases of a malignant melanoma, and phytobezoars.

2146 **INVERTED LOOP OF THE SMALL INTESTINE. LONG-TERM RESULTS AND SURGICAL INDICATIONS. 8 PERSONAL OBSERVATIONS.** *(Fr.)* Hollender, L. F. *Mem Acad Chir (Paris)* 94(29):877-889, 1968.

Reports are presented for 8 patients with severe diarrhea and malabsorption which developed after vagotomy and gastroenterostomy or pyloroplasty (3 cases), extensive resections of the small intestine (2 cases), an attempt to repair an ileostomy (1 case), and right colectomy with resection of the ileum (1 case). One patient had idiopathic diarrhea. Segments of small intestine, ranging from 13-16 cm in length, were inverted in a clockwise (5 cases) or counterclockwise (3 cases) direction. An end-to-end anastomosis was made with 1 line of sutures. Considerable improvement was obtained in 4 cases, moderate improvement in 1, and little or no improvement in 3. One patient developed acute peritonitis due to intestinal perforation. This procedure is recommended only if more conservative therapy fails.

2147 **A HISTOCHEMICAL STUDY OF THE EPITHELIUM OF THE SMALL INTESTINAL MUCOSA FOLLOWING GASTRIC RESECTION.** *(Pol.)* Kalina, Z. (1st Clin. Int. Dis., Acad. Med. Katowice, Poland). *Pol Arch Med Wewnet* 41(4):471-476, 1968.

Histochemical tests for tetrazolium reductase, γ-glutamyl transpeptidase and acid deoxyribonuclease were performed on samples of small intestinal mucosa obtained from 40 patients who had been subjected to Reichel-Polya gastrectomy 4-8 yr before. The results of histochemical reactions were then correlated with the histological appearance of the small intestine. In 22 patients with more or less pronounced histological abnormalities in the small intestinal mucosa, there was a general decrease in γ-glutamyl transpeptidase activity while the tetrazolium reductase activity not only showed a general decrease but also a shift in localization from the apical portions of the brush border to the underlying cells. There were no changes in deoxyribonuclease activity. The histochemical changes detected undoubtedly reflect changes in mucosal metabolism which may be related to the clinical symptoms in these patients.

2148 **A MORPHOLOGICAL AND CLINICAL CONTRIBUTION TO THE INTESTINAL DISEASES: SMALL INTESTINAL BIOPSY.** *(Ger.)* Nemetschek-Gansler, H. (Inst. Gen. Path., U. Heidelberg, Germany) and A. Wagner. *Virchow Arch Path Anat* 346(2):154-167, 1969.

Duodenal and jejunal biopsy specimens from 14 patients with various forms of small intestinal disease (3 with postgastrectomy syndromes, 4 with regional enteritis, 6 with sprue or primary malabsorption, and 1 with a disorder of protein absorption) were examined under the light- and electron microscope to determine the most characteristic morphological features of each disease entity. It was found that there are no qualitative differences between these various diseases in the pathological alterations shown by the small intestinal mucosa. The principal finding in each specimen examined was increased proliferation of the cells of the mucosa and lamina propria (so-called microcellular infiltration), which resulted in a loss of functionally active cells and degeneration of the villous musculature. Detailed descriptions are provided of the ultrastructure of the various forms of dividing cells, which cannot be clearly distinguished from inflammatory cells under the light microscope. The electron microscope reveals the absence of granulation and the increased occurrence of double centrioles, spindle tubules, pseudoamitoses and cytoplasmic division, indicating atypical proliferation. This is felt to be the nonspecific result of intestinal irritation, with only quantitative differences between the various disease entities.

2149 SMALL INTESTINE HISTOLOGY, RADIOLOGY AND ABSORPTION IN HYPERTHYROIDISM. *(E.)* Hellensen, C. (Fredriksberg Hosp., Copenhagen, Denmark), T. Friis, E. Larsen and O. C. Pock-Steen. *Scand J Gastroent* 4(2):169-175, 1969.

In a series of 20 patients with untreated hyperthyroidism, malabsorption was found in 13, by estimation of fecal fat excretion, vitamin A tolerance test, and D-xylose tolerance test. Biopsy of the small intestine and light microscopy revealed round-cell infiltration and edema in 16 cases. X-ray of the small intestine showed wide circular folds, a decreased transit time, and/or enlarged coils, in 19 cases. After treatment the steatorrhea subsided in 5, the D-xylose tolerance returned to normal in all, whereas the histological and radiological appearances showed a tendency to normalization in 6 and 11 patients, resp.

2150 HYPERTROPHY OF THE SMALL INTESTINE AFTER ITS PARTIAL RESECTION IN THE RAT–SIZE OF THE MUCOSAL SURFACE. *(E.)* Skála, I. (Dept. Surg., Fac. Hyg., Prague-Vinohrady, Czechoslovakia), V. Hromádková and J. Skála. *Digestion* 2(1):23-34, 1969.

Three weeks after transection of the intestine and resection of half the small intestine resp., in rats hypertrophic mucosal changes were assessed quantitatively. It was revealed that after resection (and to a small extent also after transection alone) the mucosal area of the stump increases due to prolongation of the villi and a slight increase of the diameter of the intestine but not as a result of longitudinal intestinal growth. The increase is greatest in the ileum whereby the area of the mucosa per unit of length of intestine is even greater than the values recorded in the jejunum. Thus a reverse distal-proximal gradient of the intestinal absorption surface develops. The increase of the area of the mucosal surface correlates relatively closely with the prolongation of the villi. Between the experimental groups no differences were found in the number and mutual ratio of enterocytes and goblet cells. From the results of assessment of the mucosal area it is apparent that three weeks after resection of half of the intestine the absorption surface roughly doubles and reaches the original area.

2151 EXAMINATIONS OF THE MUCOSA OF THE SMALL INTESTINE WITH THE SCANNING ELECTRON MICROSCOPE. *(E.)* Demling, L. (Munic. Hosp., Karlsruhe, Germany), V. Becker and M. Classen. *Digestion* 2(1):51-60, 1969.

Biopsy specimens of human jejunal mucosa were examined with the Stereoscan technique for the first time. With this method it was possible, also for the first time, to represent the three-dimensional structure of the mucosa surface at magnifications of up to x10,000. In addition to constriction furrows manifested by the villi, a striking feature was the fact that the surface of the individual cells projects hemispherically, with the result that an increase in the absorption surface of at least 25% is achieved. Moreover, a fine nodulation was detected, which we suppose to correspond to the microvilli. Variations in the fine structure of the cell surface between a normal mucosa and one showing slight changes in light microscopic examination, could not be determined.

2152 SMALL BOWEL PERFORATION FROM SOLITARY METASTASIS OF CLINICALLY UNDETECTED PULMONARY GIANT CELL CARCINOMA. [CASE REPORT] *(E.)* Wellman, K. F. (Kingsbrook Jewish Med. Ctr., Brooklyn, N. Y.), Y. Chafiian and E. Edelman. *Amer J Gastroent* 51(2):145-150, 1969.

2153 REACTIVITY OF THE NERVOUS APPARATUS OF AN INTESTINAL TRANSPLANT. *(Rus.)* Stovichek, G. V. (Yaroslavl Med. Inst., USSR) and V. M. Nikulin. *Arkh Anat* 56(1):57-63, 1969.

2154 PROBLEMS OF SUBTOTAL RESECTION OF THE SMALL INTESTINE. *(Ger.)* Overbeck, W. (Surg. Clin., U. Freiburg/Breisgau, Germany), K. Beck, M. Helms and W. Hallauer. *Bull Soc Int Chir* 27(5):373-378, 1968.

2155 DUODENAL DUPLICATION IN A NEWBORN: A 19-YEAR FOLLOW-UP. *(Fr.)* Salmon, M. *Mem Acad Chir (Paris)* 94(29):860-867, 1968.

2156 A CASE OF TRAUMATIC INTUSSUSCEPTION OF THE JEJUNUM. *(Gr.)* Kremmydas, V., G. Mikhalitsianos and P. Arvanitis. *Acta Chir Hellen* 95(5):700-702 1968.

2157 DIVERTICULOSIS AND DIVERTICULITIS OF THE SMALL INTESTINE. *(Gr.)* Maniatis, N. (Surg. Clin., U. Giessen, Germany) and N. Papastavros. *Galenus* 10(7/8):396-399, 1968.

2158 MULTIPLE INTUSSUSCEPTION OF THE UPPER JEJUNUM ASSOCIATED WITH STATUS EPILEPTICUS: REPORT OF A CASE. *(E.)* Valtonen, E. J. (Dept. Anat., U. Helsinki, Finland). *Ann Med Intern Fenn* 57(3):135-137, 1968.

2159 LATERAL DUODENAL DEFECTS. *(E.)* Camp, T. F. Jr. (USAF Sch. Aerospace Med., Brooks Air Force Base, Texas), D. B. Skinner and J. M. Connolly. *Amer J Surg* 115(3):291-294, 1968.

2160 THE SYMPTOMATOLOGY, DIAGNOSIS AND MANAGEMENT OF TUMOURS OF THE SMALL INTESTINE. *(E.)* Brookes, V. S. *Current Med Drugs* 8(10):11-22, 1968.

2161 **SURGICAL ASPECTS OF ENTERITIS NECROTICANS IN THE HIGHLANDS OF NEW GUINEA.** *(E.)* Smith, F. (Goroka Base Hosp., Eastern Highlands, New Guinea). *Aust New Zeal J Surg* 38(3):199-205, 1969.

2162 **TUMOURS OF THE SMALL BOWEL.** *(E.)* Macbeth, W. A. A. G. (U. Otago Med. Sch., Dunedin, New Zealand) and J. F. Gwynne. *Aust New Zeal J Surg* 38(3):206-215, 1969.

2163 **AN UNUSUAL CASE OF INTESTINAL OBSTRUCTION.** *(E.)* MacMillan, D. (Queen Mary's Hosp., Sidcup, England). *Brit J Clin Pract* 23(1):33, 1969.

2164 **ACUTE OBSTRUCTION OF THE ILEUM DUE TO NECROTIC INFLAMMATION OF A MECKEL'S DIVERTICULUM.** *(Gr.)* Papageorgiou, A. ("Penteli" I. K. A. Hosp., Greece), N. Khatzopoulos and S. Liaropoulos. *Acta Chir Hellen* 95(4):569-573, 1968.

2165 **EXPERIMENTAL STUDIES IN INTESTINAL ALLOGRAFTS.** *(E.)* State, D. (Albert Einstein Coll. Med., Bronx, N. Y.). *Surg Clin N Amer* 49(3):547-552, 1969.

2166 **DYNAMIC OCCLUSION DURING THE LONG COURSE OF APPARENTLY ISOLATED INTESTINAL SCLEROSIS: ITS RELATION TO SCLERODERMA. [CASE REPORT]** *(Fr.)* Lagache, G. (Munic. Hosp., Lille, France), A. Dupont, B. Combemale, C. L'Hermine, M. Vankemmel and C. Proye. *Mem Acad Chir (Paris)* 95(1/2/3):69-77, 1969.

2167 **A CASE REPORT OF PNEUMATOSIS CYSTOIDES INTESTINALIS.** *(Jap.)* Konaka, K. (Miyakonojo Natl. Hosp., Japan), T. Matsuoka and T. Kai. *Iryo* 22(11):1338-1341, 1968.

2168 **SURGERY IN CONGENITAL JEJUNAL STENOSIS.** *(Jap.)* Ikejiri, T. (Fukuoka-Chuo Natl. Hosp., Japan), T. Nomiyama, K. Yamaguchi, M. Yamashita and E. Tasaka. *Iryo* 22(11):1333-1337, 1968.

2169 **SURGICAL TREATMENT OF EXTERNAL DUODENAL FISTULA.** *(Rus.)* Betaneli, A. M. (Tiflis State Inst. Postgrad. Med., USSR), B. T. Mamrikishvili and D. L. Gedenidze. *Khirurgiia (Moskva)* 45(1):116-117, 1969.

2170 **A RECURRENCE OF ADHESIVE INTESTINAL OBSTRUCTION AFTER NOBLE'S OPERATION.** *(Rus.)* Chulanov, B. I. (Irkutsk Med. Inst., USSR). *Khirurgiia (Moskva)* 45(1):117-118, 1969.

2171 **NON-SPECIFIC ULCERS OF THE SMALL INTESTINE.** *(Rus.)* Polyak, R. I. (Kuban Med. Inst., USSR) and A. A. Fisher. *Khirurgiia (Moskva)* 45(1):130-134, 1969.

2172 **SURGICAL TREATMENT OF MECKEL'S DIVERTICULUM.** *(Rus.)* Savchuk, B. D. (N. I. Pirogov Med. Inst. #2, Moscow, USSR), V. D. Ryndin and A. Zh. Miranda. *Khirurgiia (Moskva)* 45(1):71-78, 1969.

2173 **ACUTE ULCERO-NECROTIC ILEITIS.** *(Por.)* Levy, S. (Fed. U. Rio de Janeiro, Brazil). *Folha Med* 58(1):9-19, 1969.

2174 **ACUTE FREE PERFORATION OF THE SMALL INTESTINE.** *(Dan.)* Jorring, K. (Cent. Hosp., Thisted, Denmark). *Ugeskr Laeg* 131(4):149-150, 1969.

2175 **PROCEDURE AND APPARATUS FOR JEJUNOSTOMY.** *(Fr.)* Potrusil, B. (Fac. Med., Purkyne U., Brno, Czechoslovakia) and J. Uhlir. *Presse Med* 77(19):724, 1969.

2176 **DUODENAL STENOSIS OF NEOPLASTIC ORIGIN.** *(It.)* Degli Esposti, M. (Ca' Granda Greater Hosp., Milan, Italy), U. Dossena, G. Conconi and V. Soresi. *Minerva Med* 59(104):5969-5990, 1968.

2177 **DUODENOCOLIC FISTULA.** *(Pol.)* Golab, W. (Acad. Med., Warsaw, Poland). *Pol Tyg Lek* 23(48):1858-1860, 1968.

2178 **DUODENAL OBSTRUCTION DUE TO TUBERCULOUS LYMPHADENITIS. A STUDY OF FOUR CASES.** *(E.)* Chawla, S. (Lady Hardinge Med. Coll. Hosp., New Delhi, India) and K. Bery. *Clin Radiol* 20(1):99-102, 1969.

2179 **THE BLIND-LOOP SYNDROME DUE TO SIDE-TO-SIDE INTESTINAL ANASTOMOSES: CLINICAL AND SURGICAL FINDINGS. [CASE REPORT]** *(It.)* Andrei L. D., A. (Inst. Spec. Surg. Path., U. Genoa, Italy), G. Accarpio and P. Alitta. *Rass Arch Chir* 6(6):361-373, 1968.

2180 **PEUTZ-JEGHERS SYNDROME.** *(Rus.)* Zhetimkarimov, D. S. (Semipalatinsk Med. Inst., USSR). *Klin Med* 49(11):128-129, 1968.

2181 **MECKEL'S DIVERTICULUM AND AN ACUTE ABDOMEN.** *(Sp.)* Barreiro Alvarez, F. (La Paz Soc. Secur., Madrid, Spain), A. Mateo Martinez and A. Sueiro Benito. *Rev Esp Enferm Apar Dig* 28(3):309-328, 1969.

2182 **INTESTINAL OBSTRUCTION IN PATIENTS AFTER GASTRECTOMY.** *(Dan.)* Hamann, G. O. *Ugeskr Laeg* 131(11):468-469, 1969.

2183 **THE FUNCTION OF THE SMALL INTESTINE SEGMENT AT REMOTE PERIODS AFTER GASTROJEJUNODUODENOPLASTY.** *(Rus.)* Markin, S. P. (S. P. Botkin Clin. Hosp., Moscow, USSR). *Khirurgiia (Moskva)* 44(12):44-49, 1968.

2184 **AN EXPERIMENTAL STUDY OF CICATRIZATION OF THE SMALL INTESTINE IN THE RAT AFTER ABDOMINAL RADIATION.** *(Fr.)* Brunet, M. (Chair Exper. Surg., René Huguenin Cent., Paris, France), J. Leducq and J. C. Guillon. *J Chir (Paris)* 96(6):563-572, 1968.

See also 1987,1988,2314,2516,2524

2185 THE LATE RESULTS OF GASTRECTOMY FOR PEPTIC ULCER.

(Jap.) Aneha, Y. (Sendai Natl. Hosp., Miyagi, Japan) and H. Naganuma. *Iryo* 22(11):1234-1240, 1968.

The late results of gastrectomy for gastric (415 cases) or duodenal (167 cases) ulcers were studied in 582 patients operated on 3-10 yr before. The operative mortality was 1.5% (9 cases), of which 7 had undergone emergency operations for perforation or hemorrhage. Various postoperative complaints, such as pain or epigastric fullness, constipation and heartburn, were present in 27%. By subjective analysis, the results of gastrectomy were considered excellent in 86%, fair in 12% and not improved in 2%. The unimproved cases had had mild degrees of ulceration or erosion preoperatively, while the excellent results were all in cases who had severe degrees of ulceration. It was noted that after the Billroth II procedure, adhesions of the efferent jejunal loop were closely correlated with the various postoperative complaints. A few cases showed anemia, hypoproteinemia, or liver dysfunction. It is concluded that gastrectomy is of proven value in the treatment of peptic ulcer disease.

2186 ACUTE PERITONITIS CAUSED BY PERFORATION OF A PEPTIC ULCER.

(Fr.) Vayre, P. (Vaugirard Hosp., Paris, France). *Rev Prat* 19(4):439-450, 1969.

Generalized peritonitis developed in 90 and circumscribed peritonitis in 10 of 100 patients with perforated peptic ulcers (90 men and 10 women). Only 15 of these patients did not have a previous history of peptic ulcer disease. Duodenal ulcers were present in 79 cases and stomach ulcers in 21. Radiological signs of pneumoperitoneum were seen in 90 of these 100 patients. Only 2 patients were treated medically. Surgery was performed on the others 2-10 hr after aspiration of the stomach contents and resuscitation. Retrospectively, 10% of these patients did not require surgery since only small amounts of subhepatic effusion were seen and the perforation was almost closed by the liver or omentum. The perforation was sutured and the peritoneum drained in 83 cases. Two elderly patients whose sutures broke died. Three-yr follow-ups on 42 of these patients showed excellent results in 15 cases 33.7%) and persistence of the ulcer in 27 (64.3%). Repeat operations were performed on 25 patients (11 vagotomies and 14 gastrectomies). Seven emergency gastrectomies were performed with no fatalities on patients with perforations too large to close with sutures and long histories of ulcers. Vagotomies were successfully combined with suturing of duodenal perforations and isoperistaltic gastroenterostomies in 2 cases and with Judd's pyloroplasty in 6. Only 1 patient in the last group developed dumping syndrome.

2187 LESIONS OF THE DIGESTIVE TRACT OF THE PIG CAUSED BY RESTRICTION OF MOVEMENT.

(Fr.) Labie, M. C. *Arch Franc Mal Appar Dig* 58(1/2): 71-74, 1969.

Ulcers of the gastric fundus were produced in 32 of 39 piglets which were immobilized for 24 hr in a jacket and suspended so that their legs were free to move but could not touch the ground. Histological examination of these lesions showed plethora and, in some cases, hemorrhagic infarcts. Lesions were limited to mucosa in which necrotic changes were developing. Coagulation necrosis was seen in cells of the neck of the gastric glands proper, but there were no signs of inflammation. No changes, or only passive congestion, were found in the intestines. The only liver change noted was a decrease in material stained by Schiff's periodic acid reagent in the hepatocytes due to fasting and increased epinephrine secretion. Although no gross changes were found in the adrenals and their weights were within normal limits, the chromaffin cells of the medulla were almost devoid of granules. In the pancreas small areas of necrosis were found in cells of the acini and islets of Langerhans. Results obtained by treating the animals with tranquilizers support the hypothesis that these vascular and necrotic lesions are nervous in origin.

2188 THROMBOELASTOGRAPHIC STUDIES IN PATIENTS SUBJECTED TO PARTIAL GASTRECTOMY FOR PEPTIC ULCER DISEASE.

(Pol.) Glowinski, Z. (2nd Cent. Clin. Hosp., IKP WAM, Warsaw, Poland) and A. Badowski. *Pol Tyg Lek* 24(3):91-93, 1969.

The thromboelastogram was determined in 60 patients (50 men and 10 women, 30-70 yr old) who had been subjected to partial gastrectomy (30 by the method of Rydygier and 30 by the method of Hoffmeister-Finsterer) for peptic ulcer disease some 2-9 yr before. The average values on the thromboelastogram were within the normal range, with a tendency toward hypocoagulability (increases in r, k and S with decreases in ma and mE). There was no significant difference between the 2 main groups, and no correlation with age or duration since partial gastrectomy. Only 7 of the 60 patients showed a slight tendency toward hypercoagulability. The bleeding time and calcium and fibrinogen levels were also normal in both groups of patients, but the average prothrombin time was 21.8-22.6 seconds compared to 18 seconds in controls, and the prothrombin index was reduced to 84-88.7% compared to 100% in controls. Although only 5 patients had abnormally low red cell counts, 75% had a thrombocyte deficiency and serum iron levels were low in 23 cases.

2189 GASTRIC ACID SECRETION FOLLOWING MAXIMAL HISTAMINE STIMULATION IN MEN WITH DUODENAL ULCERS.

(Dan.) Hansen, J. B. (Odense Munic. Hosp., Denmark) and S. A. Pedersen. *Ugeskr Laeger* 130(40):1665-1669, 1968.

Gastric acid secretion was studied by means of the augmented histamine test in 49 males (19-78 yr old) with duodenal ulcers confirmed at operation. In 39 patients (average age 48.4 yr) with simple duodenal ulcers, the average basal and maximal acid outputs were 4.2 and 38.2 mEq/hr, resp., but the individual values showed considerable scatter. There was a significant positive correlation (r = 0.55) between the basal and maximal outputs, but the basal output cannot be used to calculate the maximal secretory capacity. There was no correlation between maximal acid output and age (r = 0.24), duration of illness, height, weight, or body surface area. In 10 patients (average age 61 yr) with duodenal ulcers complicated by pyloric stenosis, the average basal and maximal acid outputs were 4.2 and 48.5 mEq/hr, resp., also with considerable scatter of the individual ılues. There was no significant difference between the two roups of patients in maximal acid output, but the average aximal acidity was significantly higher in the group with omplicated ulcers (127 mEq H^+/liter compared to 104 in paents with simple ulcers). However, the highest acidity reorded in the group with simple ulcers was higher than any of ne values in the patients with pyloric stenosis.

190 OUR EXPERIENCE IN IRAN WITH VAGOTOMY AND A COMPARISON OF THE MORTALITY OR VAGOTOMY AND OTHER OPERATIONS PERFORMED OR CHRONIC DUODENAL ULCERS.

(Fr.) Boulvin, R. Surg. Clin., U. Meshed, Iran). *Acta Gastroent Belg* 31(12): 30-836, 1968.

Between 1955 and 1968, surgery was performed on 216 paients (187 men and 29 women) with duodenal ulcers. About 0% had never been treated before and had severe forms with omplications. Perforated ulcers were found in 48 cases, penerating ulcers with inflammatory duodenopancreatic tumors in 04 cases (61.9%), and pyloroduodenal stenosis in 132 of 168 atients on whom elective surgery was performed. Seven paients had 2 ulcers. In the beginning Polya gastrectomies were erformed on 19 patients with 6 deaths and Péan gastrectomies n 8 patients with 2 deaths. The mortality for these gastrecomies was 15%. Beginning in 1960, bilateral vagotomies were erformed by Derom's procedure on 102 patients and selective agotomies by Griffith's procedure in 3 cases. A variety of rocedures were employed to keep the duodenal circuit intact. Seven patients died for a mortality of 4.7%. Only 1 patient developed a recurrent ulcer after vagotomy. The most common operative complications included cardiopulmonary disorders (22 cases) and gastroplegia (10 cases).

2191 STUDY OF SOME ENZYME ACTIVITIES, SERUM IRON LEVELS, AND SERUM PROTEINS IN PATIENTS WITH PEPTIC ULCERS.

(It.) Romeo, S. (Inst. Surg. Symptomatol., U. Catania, Italy), S. Libra and G. Gruttadauria. *Fegato* 14(3):405-411, 1968.

Studies were run on 30 patients (23 males and 7 females, aged 21-67 yr) who had histories of peptic ulcers dating back 1-14 yr. Stomach ulcers were present in 10 cases and duodenal ulcers in 20. Serum iron levels were within normal limits in all cases. SGOT and SGPT activities were elevated in 8 cases and lactate dehydrogenase activities in 9. Total serum protein values were normal in 16 cases, reduced in 11, and elevated in 3. Albumins were reduced and globulins, particularly α_2-globulins, were increased in 8 cases.

2192 EARLY POSTOPERATIVE MORBIDITY AND MORTALITY AFTER SUBDIAPHRAGMATIC VAGOTOMY FOR ULCERS OF THE DUODENAL BULB.

(Fr.) Lagache, G. (Munic. Hosp., Lille, France), B. Combemale and C. Proye. *Acta Gastroent Belg* 31(12):845-850, 1968.

Of 892 patients undergoing surgery for ulcers of the duodenal bulb, 175 had subdiaphragmatic vagotomies. In 79 cases vagotomy was combined with antrectomy, in 67 cases with pyloroplasty, and in 29 cases with gastroenterostomy. Indications for surgery were uncomplicated ulcers in 118 cases, hematemesis in 17, perforations in 8, and stenosis in 32. Operative complications included hematemesis in 5 cases, peritonitis in 2, duodenal fistulas in 2, mechanical obstructions in 3, paralytic ileus in 4, evisceration in 2, anuria in 1, acute pancreatitis in 1, and pneumopathies in 19. There were 11 operative deaths for a mortality of 6.2% compared with a mortality of 5.7% for gastrectomies in which 2/3 of the stomach was removed. Four deaths occurred after vagotomy and antrectomy: 2 caused by peritonitis, 1 by anuria, and 1 by pleuropneumonia. Six deaths occurred after vagotomy and pyloroplasty: 2 caused by recurrences of bleeding, 1 by pleuropulmonary complications, 1 by exacerbation of pre-existent diabetes, 1 by delirium tremens, and 1 in a patient with severe cranial trauma operated on for a perforated Cushing ulcer. Hematemesis had been the indication for surgery in 5 of these 6 cases. One death occurred after vagotomy and gastroenterostomy due to bleeding from an ulceration in the lesser curvature of the stomach. On the basis of these findings, it is recommended that vagotomy be combined with pyloroplasty in well selected cases.

2193 OUR EXPERIENCE WITH VAGOTOMY FOR DUODENAL ULCERS.

(Fr.) Rovati, V. (Clin. Gen. Surg., U. Milan, Italy), A. Bastagli and S. B. Doldi. *Acta Gastroent Belg* 31(12):837-842, 1968.

Vagotomies were performed on 200 patients, most of whom were young. These patients were selected because they had short histories of duodenal ulcers but had repeatedly failed to respond to conservative treatment. Most had ulcers on the anterior wall of the duodenum with little inflammation of adjacent viscera. Gastric tonus was normal or increased, and any stomach disorders were reversible in nature. These patients had basal and vagal hyperacidity and hormonal normochlorhydria. Selective vagotomies were performed in 40 cases and truncal vagotomies in 160. Vagotomy was combined with Weinberg's procedure for pyloroplasty in 165 cases, with Finney's procedure for pyloroplasty in 29, and with gastroenteroanastomosis in 6. There were no operative deaths, and none of the patients developed diaphragmatic hernias, dysphagia and cardiospasm, or gastroplegia as a result of surgery. The stomach contents were aspirated intermittently for 4-5 days after surgery. A maximum of 10% of these patients had diarrhea for a short time after surgery. This is attributed to insufficiency of exocrine pancreatic secretion which was treated by administration of pancreatic extracts.

2194 THE POSTOPERATIVE MORTALITY AND MORBIDITY FOR SUBDIAPHRAGMATIC VAGOTOMY FOR UNCOMPLICATED DUODENAL ULCERS. COMPARISON WITH GASTRIC RESECTION.

(Fr.) Hollender, L. F. (Med. Fac., U. Strasbourg, France), G. Sava and A. G. Weiss. *Acta Gastroent Belg* 31(12):811-829, 1968.

There was only 1 operative death (0.29%) in 340 vagotomies performed in an 11 yr period compared with a 3.3% mortality for gastrectomies. Vagotomy was combined with gastroenterostomy in 188 cases, with pyloroplasty in 74 cases, and with antropylorectomy in 78 cases. Minor operative complications after vagotomies included 3 recurrences of bleeding, delay in the evacuation of gas in several cases, dysphagia and cardiospasm in 19 cases (5.5%), hiccoughs in 8 cases (2.3%), dyspepsia in 69 cases (20.2%), inflammation and edema of the anastomosis in 4 cases (1.2%), dumping syndrome in 7 cases (2.1%), mild to severe diarrhea in 62 cases, and duodenal fistulas in 2 cases

(0.58%). Dyspepsia and mild and moderate diarrhea occurred most often when vagotomy was combined with gastroenterostomy. Severe complications included very severe diarrhea in 1 case. No patients developed gastroplegia or intestinal obstructions.

2195 WORK AND GASTRODUODENAL ULCERS: THE INCIDENCE AND COURSE OF PEPTIC ULCER DISEASE IN VARIOUS OCCUPATIONS, AND THE POSSIBILITIES OF ULCER PREVENTION. *(Hun.)* Cheli, R. (Inst. Med. Path., U. Genoa, Italy) and G. Canciani. *Magy Belorv Arch* 21(5):273-279, 1968.

A review of the medical records of 200,559 employees of various types in Genoa in 1965 revealed 19,093 cases of digestive tract disease and, among these, 1801 cases of peptic ulcer (432 gastric and 1369 duodenal). Stomach ulcers showed a peak incidence age of 31-60 yr in men and 21-30 yr in women, with an increased incidence in the winter months, while duodenal ulcers showed a peak incidence age of 21-60 yr in men and 21-30 yr in women, with 2 seasonal peaks (one in the spring and one in the fall). An analysis of the incidence of peptic ulcer disease by sex and by 6 major occupational groupings revealed a stomach ulcer incidence, in men, of 0.34%, 0.04%, 0.15%, 0.08%, 0% and 0.77% among industrial workers, other factory employees, and persons engaged in commerce, finance, agriculture and housework, resp.; the comparable percentages for women were 0.07, 0.02, 0.04, 0, 0 and 0.02. For duodenal ulcer, the incidences in the same occupational groups were 1.09%, 0.20%, 0.57%, 0.11%, 0.24% and 0.51% among men, and 0.16%, 0.01%, 0.06%, 0%, 0% and 0.03% among women. Hospitalization was required for 110 cases of stomach ulcer (105 men and 5 women) and 355 cases of duodenal ulcer (341 men and 14 women). The average duration of hospitalization varied from 13 to 62 days in the various occupational groups, and somewhat over half of all hospitalized cases had to be treated surgically. Some conclusions are drawn from these incidence rates with regard to the etiology and possible prophylaxis of peptic ulcer disease.

2196 BLOOD GROUPS IN SOME DISEASES OF THE DIGESTIVE TRACT, ATHEROSCLEROSIS, AND RHEUMATIC FEVER. *(Pol.)* Machalski, M. (1st Clin. Int. Dis., Silesian Acad. Med., Katowice, Poland), Z. Kalina and J. Wodniewski. *Pol Arch Med Wewnet* 40(5):613-619, 1968.

The distribution of the ABO blood groups and the Rh Factor was compared in 837 patients with gastroduodenal ulcers, 190 with stomach cancer, 526 with cholelithiasis, 94 with Addison-Biermer anemia, 251 with atherosclerosis, 239 with rheumatic fever, 3606 with other diseases, and 11,000 healthy controls from the city of Wroclaw, Poland (data taken from Dubiski *et al.*, 1953). The percentages with blood types O, A, B and AB among the 3606 randomly selected control patients were 33.7, 40.5, 17.7 and 8.1%, resp., which was essentially the same as reported by Dubiski for healthy residents of Wroclaw. There were no significant differences between any of these groups with regard to the Rh factor, and the blood group distribution in patients with atherosclerosis, rheumatic fever and gastric ulcers was essentially the same as in controls (statistically insignificant decrease in blood group 0 and increase in blood group A, to 29.9% and 44.3%, resp., in patients with gastric ulcer). Patients with duodenal ulcers, in contrast, were 43% blood group 0 and 33.8% group A, while those with stomach cancer were only 25.5% blood group 0 and 49.3% group A. Among patients with cholelithiasis, blood group 0 was significantly less common (28.4%) and group B was more common (21.4%) than among controls.

2197 A DISCUSSION OF THE IMMEDIATE AND LONG-TERM RESULTS OF VAGOTOMY. *(Fr.)* Arianoff, A. A. (St. Elisabeth Clin., Brussels, Belgium), G. Vielle and P. van Reepinghen. *Acta Gastroent Belg* 31(12): 851-857, 1968.

Analysis of the short- and long-term results of 208 abdominal and 19 thoracic truncal vagotomies carried out for ulcers over a 9-yr period in 195 men and 32 women (mostly 30-59 yr old) revealed a postoperative morbidity of 11% and a mortality of 0.5% (death in 1 case due to irreversible gastroplegia following vagotomy and gastroenterostomy for stenotic pyloric ulcer). In 5 cases, the patient was simultaneously treated for cholelithiasis. The drainage procedure was antrectomy in 19 cases, gastroenterostomy in 65, simple pyloroplasty (Heineke-Mikulicz) in 70, and pyloroplasty plus ulcer excision (procedure of Judd-Lagrot) in 54, including 32 simple ulcers, 18 perforated ulcers and 4 bleeding ulcers. Postoperative complications included 4 involving the respiratory tract, 3 cardiovascular accidents, 1 case of surgical trauma to the spleen, 6 cases of persistent vomiting, 8 of diarrhea, and one with stenosis of the antrectomy anastomosis. Among 200 patients followed for at least 1 yr (including 183 treated by abdominal and 17 treated by thoracic vagotomy), results were very good in 15 of 17 receiving antrectomy, 51 of 61 receiving gastroenterostomy, 53 of 58 receiving simple pyloroplasty, and 48 of 48 receiving Judd-Lagrot pyloroplasty. The latter procedure is concluded to be the preferred technique, even in cases of perforation or bleeding. Subsequent surgery for cholelithiasis was required in only 4 of 207 cases after 2-7 yr. It is felt that vagotomy results in immediate atony of the sphincter of Oddi, but that this does not impair later normal gallbladder function or facilitate the formation of gallstones.

2198 PERSONAL EXPERIENCE WITH VAGOTOMY AND PYLOROPLASTY IN THE TREATMENT OF PERFORATED DUODENAL ULCERS. *(Fr.)* Stoppa, R. (U. Hosp. Ctr., Amiens, France), M. Quintyn, H. Abourachid, X. Henry and C. Duclaye. *Acta Gastroent Belg* 31(12):861-866, 1968.

Vagotomy and pyloroplasty was used in the treatment of 42 cases (mostly in patients between the ages of 25 and 50) of perforated duodenal ulcer, 2 of which were recurrences developing 3 yr after an initial episode. Seventeen of these cases were operated on the day of admission, on an emergency basis, while 8 were operated on the 2nd day and 17 others were operated on 4-12 days after admission. Due to factors such as obesity (4 cases), diabetes (2 cases), hepatomegaly (5 cases), cirrhosis (4 cases) and tuberculosis (1 case), 7 of these patients were considered to be poor surgical risks. Nevertheless, there were no deaths. There was also no visceroplegia, normal transit being reestablished in 3-5 days; the only complications were 1 abscess of the Douglas space and 3 cases of parietal infection. The average duration of hospitalization was 14 days (range 11-23 days). Among 18 cases reexamined after a follow-up of more than 18 months, 20 had very good or good results and

4 had satisfactory results. There were no signs of recurrence, and the gastric acidity did not respond to insulin stimulation. The theoretical basis for this type of peptic ulcer treatment is outlined, along with its advantages over simple suture, and the technique of vagotomy is described in some detail.

2199 **VAGOTOMY IN THE EMERGENCY TREATMENT OF PERFORATED OR BLEEDING DUODENAL ULCERS.** *(Fr.)* Carlon, C. A. (Munic. Hosp., Padua, Italy), G. Giuliani, B. Coan and R. Fogar. *Acta Gastroent Belg* 31(12):867-872, 1968.

Subdiaphragmatic truncal vagotomy, combined with the usual drainage procedures (pyloroplasty, antrectomy, and gastroenterostomy, in decreasing order of frequency), was used in the treatment of 25 patients with perforated and 41 patients with bleeding duodenal ulcers during a 4-yr period. The results are compared with those in 8 patients with perforated ulcers treated by continuous aspiration, 61 treated by simple suture, and 21 (9 with perforation and 12 bleeding) treated by classic resection. Aspiration is not to be recommended as a treatment for perforated ulcer, and the results of vagotomy were better than those of either suture or resection, particularly in younger patients. There was no mortality, and postoperative complications (gastroplegia and diarrhea in about a third of all cases) were transitory. There were only 3 cases of recurrent bleeding, after intervals of from 5 months to 2 yr, and one of these was ascribed to an incomplete vagotomy. For cases of less severe bleeding, however, treatment with cooling solutions, blood transfusions, coagulants and bedrest is still often effective.

2200 **EFFECT OF DIVERSION OF BILE AND PANCREATIC JUICE ON PENTAGASTRIN-PRODUCED DUODENAL ULCERS IN CATS.** *(E.)* Konturek, S. J. (Dept. Med., Med. Sch., Krakow, Poland) and J. Dubiel. *Scand J Gastroent* 4(1):59-64, 1969.

Gastric fistulas were produced in 49 conscious cats fitted with Thomas type small cannulas in order to study the ulcerogenic effects of pentagastrin. In 12 of the cats, the duodenal segment containing the entrance of the pancreatic and common bile ducts was transplanted to the jejunum about 15 cm below the ligament of Treitz. Pentagastrin (16 μg/kg/hr i.v.) caused submaximal gastric response from the gastric fistulas, and produced acute duodenal ulcers after a period of 24-36 hr. Increasing the dose of the stimulant in the same limits of infusion time did not augment the ulcerogenic action of pentagastrin, whereas the rate of appearance and the magnitude of the ulcer area increased with the duration of the stimulant infusion. Diversion of bile and pancreatic juice to the jejunum did not change basal acid output or the dose response curve to pentagastrin, but facilitated the ulcer formation.

2201 **SURGICAL TREATMENT OF UNCOMPLICATED DUODENAL ULCERS.** *(Fr.)* Moulle, P. *Presse Med* 77(9):317-320, 1969.

2202 **CLINICAL CHARACTERISTICS OF PEPTIC ULCERS.** *(Sp.)* Meeroff, M. (Prof. Dr. G. A. Alfaro Polyclin., Buenos Aires, Argentina) and J. C. Meeroff. *Medicina (Mex)* 49(1052):43-52, 1969.

2203 **GASTRIC ULCERS IN DOMESTIC ANIMALS: CONDITIONS UNDER WHICH THEY APPEAR AND CLINICAL PICTURE.** *(Fr.)* Tournut, M. J. (Dept. Med. Path., Natl. Veterinary Sch., Toulouse, France). *Arch Franc Mal Appar Dig* 58(1/2):61-70, 1969.

2204 **PHYSIOPATHOLOGICAL ASPECTS OF ULCERS IN DOMESTIC ANIMALS.** *(Fr.)* Le Bars, M. H. (Dept. Physiol., Natl. Veterinary Sch., Alfort, France). *Arch France Mal Appar Dig* 58(1/2):51-60, 1969.

2205 **APPLICATIONS OF THE SPASMOLYTIC AND ANALGESIC AGENCY BORT®, PARTICULARLY IN PEPTIC ULCERS.** *(Ger.)* Haake, J. (St. Joseph Hosp., Bochum, Germany). *Med Mschr* 22(10):467-468, 1968.

2206 **CAUSAL RELATIONS IN THE GENESIS OF ULCERS.** *(Ger.)* von Zedtwitz, J. (Clin. Rheum. Dis., Leukerbad, Switzerland). *Ther Umschau* 26(1):37-39, 1969.

2207 **OCCUPATIONAL ASPECTS OF PEPTIC ULCERS.** *(Dut.)* Ensing, H. (Netherlands Railway System, Hengelo). *T Soc Geneesk* 47(6):178-186, 1969.

2208 **DUODENAL FISTULAS AFTER GASTRECTOMY FOR ULCERS.** *(Fr.)* Grimoud, M. (Purpan Hosp., Toulouse, France), J. Escat, R. Saury, J. Gaillard and J. L. Gouzi. *Rev Med Toulouse* 4(9):721-731, 1968.

2209 **SURGICAL TREATMENT OF BLEEDING GASTRODUODENAL ULCERS IN A PROVINCIAL HOSPITAL.** *(Gr.)* Karakantzas, D. (Gen. Hosp., Xanthe, Greece). *Acta Chir Hellen* 95(4):476-482, 1968.

2210 **DIETETIC THERAPY OF PEPTIC ULCER WITH DRIED PEELED SWEET ALMONDS.** *(Heb.)* Kleeberg, J. (Rothschild State Munic. Hosp., Haifa, Israel). *Dap Refuiim* 27(7/8):281-283, 1968.

2211 **THE ETIOLOGY OF PEPTIC ULCERS.** *(Hun.)* Hámori, A. (2nd. Clin. Int. Med., U. Med. Sci., Pecs, Hungary). *Magy Belorv Arch* 21(6):281-297, 1968.

2212 **DYSPHAGIA AFTER SUB-DIAPHRAGMATIC VAGOTOMY.** *(Fr.)* Adloff, M. (U. Hosp. Ctr. Strasbourg, France), J. J. Kohler and A. G. Weiss. *J Chir (Paris)* 96(6):537-546, 1968.

2213 **EFFECT OF PREDNISOLONE ON THE DEVELOPMENT OF CINCHOPHEN ULCER IN THE DOG.** *(E.)* Hámori, A. (U. Med. Sci., Pecs, Hungary), T. Nemes and T. Hal. *Acta Med Acad Sci Hung* 25(3/4):315-321, 1968.

2214 **THE SURGICAL MANAGEMENT OF PEPTIC ULCERATION.** *(E.)* Milton, G. W. (Dept. Surg., U. Sydney, Australia) and J. Read. *Bull Postgrad Comm Med U Sydney* 24(10):228-241, 1969.

2215 **SUPERFICIAL GASTRIC LESION AS A CAUSE OF MASSIVE HEMORRHAGE.** *(E.)* Nummi, P. (Satakunta Cent. Hosp., Pori, Finland), S. Nummi and L. W. F. Linden. *Ann Chir Gynaec Fenn* 57(5):571-575, 1968.

2216 **RECURRENT PEPTIC ULCERATION: ACROMEGALY.** *(E.)* Spencer, J. (Royal Postgrad. Med.

Sch., London, England). *Proc Roy Soc Med* 62(3):263-264, 1969.

2217 **SIGNIFICANCE OF THE TYPE OF GASTRIC SECRETION IN THE SELECTION OF THE OPERATION FOR PEPTIC ULCERS.** *(Rus.)* Poliak, R. I. (Stavropol Med. Inst., USSR) and A. A. Fisher. *Klin Khir (Kiev)* (10):32-37, 1968.

2218 **PEPTIC ULCERS IN OLDER PEOPLE.** *(Cz.)* Mann, M. (Nove Mesto Hosp., Czechoslovakia). *Cesk Gastroent Vyz* 22(8):513-518, 1968.

2219 **IMMEDIATE RESULTS OF THE SURGICAL TREATMENT OF A PEPTIC ULCER. I. UNCOMPLICATED ULCER; PERFORATION.** *(Sp.)* Balibrea Cantero, J. L. (Fac. Med., Madrid, Spain), J. De Palacios Carvajal and G. F. Joachim. *Rev Clin Esp* 111(3):263-276, 1968.

2220 **PEPTIC ULCERS FROM THE VIEWPOINT OF INTERNAL MEDICINE.** *(Jap.)* Takaki, M. (1st Tokyo Natl. Hosp., Japan) and M. Kono. *Iryo* 22(11):1225-1233, 1968.

2221 **ORGAN-SPARING AND ORGAN-PRESERVING OPERATIONS IN PEPTIC ULCER.** *(Rus.)* Perkin, E. M. (Novokunets State Inst. Postgrad. Med., USSR). *Khirugiia (Moskva)* 45(1):43-47, 1969.

2222 **LONG-TERM RESULTS OF OPERATIONS FOR PERFORATED ULCERS.** *(Rus.)* Surin, V. M. (Hosp. Mordovian Republ., USSR), G. A. Izmailov, I. N. Piksin and A. A. Semochkin. *Khirurgiia (Moskva)* 45(1):28-30, 1969.

2223 **PECULIARITIES OF THE COURSE AND RESULTS OF SURGICAL TREATMENT FOR PEPTIC ULCERS IN THE EXTREME NORTHEAST.** *(Rus.)* Chudinov, V. S. (Magadan Region. Hosp., USSR). *Khirurgiia (Moskva)* 45(1):47-53, 1969.

2224 **USE OF HARBERER-ZAITSEV RESECTION OF THE STOMACH.** *(Rus.)* Vel'skii, V. M. (Rovenk District Hosp., USSR), E. M. Borovyi and V. M. Bas. *Khirurgii (Moskva)* 45(1):54-58, 1969.

2225 **THE PATHOPHYSIOLOGY OF MASSIVE GASTROINTESTINAL BLEEDING.** *(Ger.)* Varró, V. (1st Med. Clin., U. Szeged, Hungary). *Z Ges Inn Med* 23(23):742-744, 1968.

2226 **SHORT- AND LONG-TERM RESULTS OF COMPLEX THERAPY IN PATIENTS SUFFERING FROM PEPTIC ULCERS AT A HEALTH RESORT.** *(Rus.)* Gokhar'-Kharmandar'yan, L. G. (Cent. Inst. Resorts Physiother., Moscow, USSR). *Vop Kurort Fizioter* 33(6):491-493, 1968.

2227 **THE MOST INTERESTING ASPECTS OF ULCERS OF THE LESSER CURVATURE OF THE STOMACH.** *(Sp.)* Romero, A. M. *Rev Esp Erferm Apar Dig* 28(1):25-34, 1969.

See also 1899,2020,2026,2033,2035,2101,2107,2111,2115,2345,2511,2599

2228 **DEVELOPMENT OF DELAYED HYPERSENSITIVITY TO DINITROCHLOROBENZENE IN PATIENTS WITH CROHN'S DISEASE.** *(E.)* Jones, J. V. (United Birmingham Hosp., England), J. Housley, P. M. Ashurst and C. F. Hawkins. *Gut* 10(1):52-56, 1969.

The ability to develop delayed hypersensitivity to tuberculin and to dinitrochlorobenzene (DNCB), a potent chemical antigen, has been studied in 26 patients with Crohn's disease. Delayed hypersensitivity to dinitrochlorobenzene failed to develop in 15 of the 26 patients; 20 control subjects developed delayed hypersensitivity to DNCB in the normal way. Of the 15 DNCB-negative patients, 10 (67%) also failed to develop delayed hypersensitivity to 100 U of old tuberculin. Of the 11 DNCB-positive patients, only four (36%) were tuberculin-negative. There was no correlation between the response to DNCB and the extent or activity of the Crohn's disease. These results indicate that patients with Crohn's disease show a depression of delayed hypersensitivity reactions.

229 **CROHN'S DISEASE AND CANCER.** *(Dut.)* Bloquiaux, W. (Fabrikkaai 23, Kortrijk, Belgium). *Gastroent* 11(5):496-500, 1968.

230 **CLINICAL AND SURGICAL PROBLEMS IN REGIONAL ENTERITIS.** *(Ger.)* Nagel, M. (Surg. Clin., U. Mainz, Germany) and J. Schier. *Ther Umschau* 26(1):43-47, 1969.

2231 **IS TERMINAL ILEITIS A PSYCHOSOMATIC DISEASE?** *(Ger.)* Langen, D. (Psychother. Clin., Gutenberg U., Mainz, Germany). *Ther Umschau* 26(1):11-15, 1969.

2232 **OBSTRUCTIVE HYDRONEPHROSIS: A FREQUENT BUT SELDOM RECOGNIZED COMPLICATION OF GRANULOMATOUS DISEASE OF THE BOWEL.** *(E.)* Present, D. H. (Mount Sinai Hosp., New York, N. Y.) J. G. Rabinowitz, P. A. Banks and H. D. Janowitz. *New Eng J Med* 280(10):523-528, 1969.

2233 **REGIONAL ILEITIS IN EL SALVADOR.** *(Sp.)* Martinez M., G. (San Juan de Dios Hosp., Santa Ana, El Salvador). *Arch Col Med El Salvador* 21(4):284-287, 1968.

2234 **SURGICAL TREATMENT OF TERMINAL ILEITIS.** *(Rus.)* Vitebskii, Ia. D. (Kurgan Regional Hosp., USSR). *Khirurgiia (Moskva)* 44(12):70-72, 1968.

See also 2279

2235 EXPERIMENTAL STUDIES ON THE SPECIFICITY OF CHANGES IN THE MUCOSA OF THE SMALL INTESTINE IN CELIAC DISEASE. *(Ger.)*

Riecken, E. O. (Med. Clin., U. Marburg/Lahn, Germany), R. Rosenbaum, R. Bloch, H. Menge, E. Ritt, M. Aslan and W. Dölle. *Klin Wschr* 47(4):202-214, 1969.

In an attempt to find an experimental model for the study of idiopathic steatorrhea, female Wistar rats were given 5 or 50 mg/kg/day of triparanol dissolved in corn oil for 10-21 days through an esophageal catheter; controls were untreated or received corn oil alone. Administration of triparanol did not produce villous atrophy, which occurs in celiac disease, but significantly increased the depth of the crypts and the width of the villi in the small intestine. Consistent decreases occurred in the membrane enzymes (nonspecific alkaline phosphatase and ATPase) and in the lysosomal enzymes (acid phosphatase and β-glucoaminidase). In all cases these were associated with increases in enzyme granules in the Golgi region and, in the case of the lysosomal enzymes, with diffuse activity in the epithelium and an increase in enzyme-positive macrophages in the villous stroma. Similar changes occurred, but to a lesser extent, in mitochondrial enzymes. The activities of thiamine pyrophosphatase and microsomal esterase were also reduced. These cytochemical changes are similar to those seen in celiac disease. Electron microscopic findings 10 days after 50 mg/kg/day of triparanol included swelling and disorientation of the mitochondria and endoplasmic reticulum and enlargement of vesicles in the Golgi apparatus. Rats treated with 50 mg/kg/day of triparanol absorbed only 20% as much glucose as controls and those treated with 5 mg/kg/day absorbed about half as much.

2236 DISTURBANCES IN INTESTINAL ABSORPTION IN CHRONIC LIVER DISEASES. *(It.)*

De Dominicis, A. (Inst. Clin. Trop. Infect. Dis., U. Rome, Italy) and A. Sebastiani. *Fegato* 14(3):413-420, 1968.

Fecal excretion of ^{131}I was measured after administration of Lugol's solution to block thyroid iodine uptake and oral administration of ^{131}I-labeled triolein, oleic acid, and serum albumin and i.v. administration of ^{131}I-labeled polyvinylpyrrolidone. Fecal excretion of all these substances was higher in cirrhotics than in controls and was higher in patients with advanced cirrhosis than in those in the initial stages of the disease. Of all those studied, patients with jaundice excreted the largest amounts.

2237 EXPERIMENTAL STUDY OF THE PATHOGENESIS OF CELIAC SYNDROME. OBSERVATIONS ON RABBITS IMMUNIZED WITH FRAZER'S III AF GLUTEN FRACTION. *(It.)*

Bardare, M. (Pediat. Clin., U. Milan, Italy), A. Giunta and G. Barbiano di Belgiojoso. *Boll Ist Sieroter Milan* 47(11/12):636-643, 1968.

Three rabbits were immunized i.p. with injections of 930 mg of Frazer's III AF gluten fraction per week for 2 months. Complete Freund's adjuvant was also given to 2 animals. Before sacrifice the rabbits were given gluten p.o. for 3 days. Ouchterlony's double diffusion method showed that antigluten antibodies were present in serum but not in the spleen. No antigen or antibodies were found in the mucosa of the small intestine. Immunofluorescence studies showed 2 rabbits had antigluten antibodies in the appendix and spleen but not in the kidneys. The only functional change in the small intestine was a reduction in the glycyl-1-valine peptidase activity in 1 animal. Except for 1 case, in which there were slight nonspecific changes in the mucous cells, immunization produced no gross or microscopic changes in the mucosa of the small intestine. However, diffuse lymphatic hyperplasia was present in 3 cases and hyperplasia of macrophages in the appendix was present in 2. While this experimental model is not identical with celiac disease in humans, it casts some doubt on the hypothesis that an antigen-antibody reaction in the intestinal mucosa is responsible for morphological and functional changes in celiac disease.

2238 DISACCHARIDE HYDROLYSIS IN THE GASTROINTESTINAL INFECTIONS OF THE YOUNG CHILD. *(Fr.)*

Jean, R. (St. Charles Clin., Montpellier, France), H. Bonnet and P. Kochoyan. *Cah Coll Med Hop Paris* 10(1):9-18, 1969.

Among 36 previously healthy children (40 days to 7 yr of age, but including 27 between 2 and 24 months) hospitalized for gastrointestinal infections (*Giardia lamblia* in 5, pathogenic staphylococci in 6, pathogenic *E. coli* in 5, *Salmonella* spp. in 9) and treated with various antibiotics (not including neomycin) plus a milk-free diet for periods varying from a few days to several months, the increase in blood sugar following an oral dose of lactose (32 g/1.73 m^2) varied from 0 to 166% of the control level and was below 20% in 17 of the 35 tested successfully (including 7 cases with no increase at all). Duodenal or jejunal lactase activity was definitely subnormal in 6 of 14 cases, but the microscopic appearance of the mucosa was normal except for signs of recent inflammation. The lactose absorption returned to normal levels in 9 of 12 children retested after discharge from the hospital. Sucrose absorption, measured in the same way, was definitely subnormal in only 2 of 14 cases, and sucrase activity was subnormal in only 2 of 11 (one of these probably being due to technical factors). Xylose and lipoidol absorption were normal in 10 of 13 cases tested, and glucose absorption was normal in all. Among the 6 children with subnormal lactase activities, the sucrase/lactase ratio varied from 4.3 to 130 in 4 cases, while in the other 2 the general loss of enzymatic activity was ascribed to technical factors. One case (34-month-old male infant) with a generalized disaccharidase deficiency due apparently to infection with *Salmonella panama* is described in detail. It is concluded that lactose malabsorption, and hence milk intolerance, is a common complication of gastroenteritis, especially lambliasis.

2239 SERUM IMMUNOGLOBULINS AND LYMPHOCYTE TRANSFORMATION STUDIES IN COELIAC DISEASE. *(E.)*

Blecher, T. E. (Royal Infirm., London, England), A. Brzechwa-Ajdukiewicz, C. F. McCarthy and A. E. Read. *Gut* 10(1):57-62, 1969.

Serum immunoglobulin levels were estimated in 30 patients with celiac disease not on gluten-free diets. Phytohaemagglutinin-induced lymphocyte transformation was studied in 10 of these patients by two different techniques. Eleven of the 30 patients had subnormal levels of IgM and two increased levels; 11 patients had raised IgG levels; eight patients had raised, and three patients subnormal, levels of IgA. Phytohemagglutinin-induced lymphocyte transformation was mildly to severely impaired in five of the 10 cases studied (and tritiated thymidine uptake in four of these) when whole-leukocyte-rich plasma was cultured. Culture of washed leukocytes in autologous serum with phytohemagglutinin showed impaired transformation in only three of these cases, and reduced labelling in one of these and one of the other cases was defective by the first culture method. Serum exchange experiments showed, with one exception, no inhibitory effect of patients' sera on washed normal lymphocyte cultures. Defective transformation of patients' lymphocytes was irregularly improved in about half of the tests by culture in normal serum but not, in two experiments, by the sera of patients showing impaired transformation. No consistent correlation existed between impaired transformation and immunoglobulin abnormalities in these 10 patients. It is possible that impaired transformation might presage the future development of reticulosis in these patients.

2240 ANALYSIS OF PERORAL JEJUNAL BIOPSIES IN CLINICALLY ASYMPTOMATIC PARENTS OF CHILDREN WITH CELIAC SPRUE. *(E.)* Fric, P. (2nd Res. Unit Gastroent., Charles U., Prague, Czechoslovakia), Z. Lojda, J. Jodl and F. Malis. *Digestion* 2(1):35-42, 1969.

Peroral jejunal biopsies were performed in both clinically asymptomatic parents of 15 children with celiac sprue. Histological, histochemical and biochemical examination revealed various alterations in 24 parents. Irregular configuration of villi, increased quantity of cytoplasmic RNA in enterocytes and decreased activities of membrane enzymes, shift of LDH-monomers in favor of the H-form and a decrease of total activity of lactase and cellobiase were found. The origin of changes, particularly their relation to the ingestion of gluten or to other injuries of the jejunal mucosa as well as to some hereditary mechanism, remains unknown at the present time.

2241 CLINICO-PATHOLOGICAL STUDY OF A PATIENT WITH "MEDITERRANEAN" TYPE OF ABDOMINAL LYMPHOMA AND A NEW TYPE OF IgA ABNORMALITY ("ALPHA CHAIN DISEASE"). *(E.)* Rambaud, J. C. (St. Lazare Hosp., Paris, France), C. Bognel, A. Prost, J. J. Bernier, Y. Le Quintrec, A. Lambling, F. Danon, D. Hurez and M. Seligmann. *Digestion* 1(6):321-336, 1968.

2242 DISTURBANCES IN SMALL INTESTINAL ABSORPTION CAUSED BY BACTERIA. *(Ger.)* Begemann, F. (1st Med. Clin., U. Hamburg, Germany). *Fortschr Med* 87(5):205-208, 1969.

2243 SYNDROME OF MILK INTOLERANCE AND REDUCED LACTASE ACTIVITY IN THE SMALL INTESTINE. *(Fr.)* Terris, G. (Laennec Hosp., Paris, France) and M. Tescher. *Sem Hop Paris* 45(9):587-591, 1969.

2244 LACTOSE INTOLERANCE: A NEWLY RECOGNIZED CAUSE OF GASTROINTESTINAL SYMPTOMS SEEN IN THE PRACTICE OF OCCUPATIONAL MEDICINE. *(E.)* McDonagh, T. J. (Standard Oil Co., New York, N. Y.). *J Occup Med* 11(2):57-64, 1969.

2245 LYMPHOMAS OF SMALL BOWEL AND THEIR RELATIONSHIP TO IDIOPATHIC STEATORRHEA. *(E.)* Spence, W. J. E. (Dept. Surg., U. Toronto, Ontario) and S. Ritchie. *Canad J Surg* 12(2):207-209, 1969.

2246 VITAMIN A ABSORPTION IN CELIAC DISEASE AND WHIPPLE'S DISEASE. *(Ger.)* Kasper, H. (Med. Clin., Justus Liebig U., Giessen, Germany). *Verh Deutsch Ges Inn Med* 74:614-616, 1968.

2247 DISTURBANCES IN VITAMIN B_{12} ABSORPTION IN HYPOCALCEMIA. *(Ger.)* Castrillón-Oberndorfer, W. L. (Med. Clin., U. Tübingen, Germany) and H. D. Bundschu. *Verh Deutsch Ges Inn Med* 74:611-614, 1968.

2248 MALABSORPTION AND DIABETES MELLITUS IN CHILDREN. *(E.)* Hooft, C. (Dept. Pediat., State U., Ghent, Belgium), J. Kriekemans and J. van Damme. *Helv Paediat Acta* 23(5):478-488, 1968.

2249 MALABSORPTION IN CANCER OF AND OUTSIDE THE BOWEL. *(E.)* Berndt, H. (Robert Rössle Clin., Berlin, Germany). *Digestion* 1(5):305-310, 1968.

2250 CLINICAL AND GENETIC ASPECTS OF LACTOSE INTOLERANCE IN ADULTS. *(Ger.)* Siebner, H. (Med. Polyclin., U. Tübingen, Germany). *Med Welt* 19(45):2469-2472, 1968.

2251 ETIOPATHOGENETIC ASPECTS OF MALABSORPTION IN PATIENTS WITH LIVER DISEASES. *(Sp.)* Solis Herruzo, J. A. (Fac. Med., Madrid, Spain) and J. De Portugal Alvarez. *Rev Clin Esp* 111(3):239-258, 1968.

See also 1841,1865,2006,2015,2024,2025,2107,2304,2382

2252 **THE DIFFERENTIAL DIAGNOSIS BETWEEN DIVERTICULAR TUMORS AND SIGMOID CARCINOMAS.** *(Ger.)* Bellmann, H. (Surg. Clin., Karl Marx U., Leipzig, Germany) and H. Graetz. *Zbl Chir* 94(8):241-254, 1969.

Case reports are presented for 4 patients (3 men and 1 woman, aged 61-67 yr) with diverticular tumors of the sigmoid. Associated conditions included chronic appendicitis; nonspecific chronic lymphadenitis and a polyp of the large intestine; and a hiatus hernia. Sigmoid carcinomas were ruled out by histological examinations which showed that the 3 men had tumors produced by muscular hyperplasia and the women had a tumor produced by severe chronic cicatricial inflammation. Quenu's procedure for abdominal amputation of the rectum was performed on 1 patient whose tumor was located very low in the sigmoid. Operative complications included healing by second intention in one case and pneumonia in another.

2253 **THE SYNDROME OF THE FLOATING LEFT COLON AND THE LEFT BRACHYCOLON. 20 CASES.** *(Fr.)* Dubarry, J. J., Marambat and A. Quinton. *Arch Franc Mal Appar Dig* 58(1/2):25-40, 1969.

Brief reports are presented for 20 patients (13 males and 7 females, aged 14-85 yr) with floating left colon and left brachycolon. The only other anomalies present were left dolichocolon (13 cases), dolichosigmoid (1 case), and a large splenic flexure of the colon (1 case). The etiology of this anomaly is considered to be shortness of the colon in 3 cases, excessive length of the colon in 15 cases, and detachment of the left mesocolon in 1 case. The most prominent clinical symptoms were constipation (13 cases), colic (3 cases), meteorism typically found in dolichocolon (5 cases), pseudobiliary symptoms (7 cases), signs of partial intestinal obstruction (3 cases). In 1 case the intestinal anomaly was latent and was discovered during radiological examination for a duodenal ulcer. Most of these patients responded to medical treatment consisting of large doses of bismuth or graphite, mucilage, mineral oil, cholagogues, and antispasmodics.

2254 **HISTOCHEMICAL STUDIES OF THE COLONIC MUCOSA IN ULCERATIVE COLITIS AND OTHER COLONIC DISEASES.** *(E.)* Binder, V. (Gentofte Hosp., Copenhagen, Denmark). *Scand J Gastroent* 3(6):611-621, 1968.

A number of oxidative enzymes were studied in colonic and rectal mucosa using histochemical techniques. In all 105 biopsy specimens from 73 patients suffering from ulcerative colitis presenting varying degrees of inflammatory activity were studied. In addition 46 biopsy specimens from 45 patients suffering from colonic disease other than ulcerative colitis, and 12 biopsy specimens from 12 patients without colonic disease served as controls. The activity of succinate dehydrogenase, mitochondrial-α-glycerophosphate dehydrogenase and Ubiquinone in the epithelial cells was decreased in ulcerative colitis presenting moderately or very active inflammation in the mucosa. Increasing inflammation was accompanied by decreasing enzyme activity. The NADP-diaphorase and glucose-6-phosphate dehydrogenase reactions showed a staining pattern in 84 out of 105 ulcerative colitis specimens, which differed markedly from the normal pattern. The luminal rim of the epithelial cells was intensely stained while the rest of the cells showed a weaker staining than normal. Twenty-one cases presenting normal reaction pattern showed no or only weak inflammatory activity in the mucosa. The abnormal staining pattern has previously been described as being specific for ulcerative colitis, but in 11 out of 46 biopsy specimens from patients suffering from colonic disease other than ulcerative colitis the same abnormal pattern was seen.

2255 **ABSORPTION OF WATER AND ELECTROLYTES IN CROHN'S DISEASE OF THE COLON.** *(E.)* Head, L. H. (Palo Alto VA Hosp., Calif.), J. W. Heaton and R. M. Kivel. *Gastroenterology* 56(3):571-579, 1969.

Colonic absorption of sodium, potassium, chloride, and water was studied in 8 patients with Crohn's disease of the colon (granulomatous colitis) by a perfusion technique using polyethylene glycol 4000 and radioisotopes as markers. Compared with 3 healthy control subjects, net absorption of sodium, chloride, and water was decreased. Insorption of sodium and water was also decreased; potassium fluxes were not significantly altered. Absorption in 3 patients tested both pre- and postoperatively and in 5 others tested periodically after bypass ileostomy did not improve, despite clinical remission.

2256 **CRITICAL EVALUATION OF INTERNAL HEMORRHOIDAL LIGATION AS AN OUTPATIENT PROCEDURE.** *(E.)* Eastman, P. F. (Dept. Surg., South California Permanente Med. Group, Harbor City) and I. A. Applebaum. *Amer J Proctol* 20(2):109-114, 1969.

The safety, efficacy, surgeon and patient acceptance of outpatient ligation of internal hemorrhoids were studied at a large hospital where 464 rubber band ligations were performed on 196 adults. Incidence of hemorrhage following this procedure indicated that rubber band ligation is as safe as the operative hemorrhoidectomy performed in the hospital. Responses to questionnaires sent to the first 51 of the 196 patients indicated that: 1) the procedure was effective in relieving symptoms. 2) the procedure was relatively painless and not disabling. 3) the majority of patients would willingly undergo the treatment again if the symptoms recurred. The increase in the numbers of patients treated for hemorrhoids plus a significant decrease in the number of operative hemorrhoidectomies performed at this hospital indicated that surgeons and patients both found the treatment acceptable.

2257 **COLONIC ENDOMETRIOSIS: REPORT OF A CASE.** *(E.)* Lewis, M. I. (Queen of Angels Hosp., Los Angeles, Calif.) and F. Rio. *Dis Colon Rectum* 12(2):137-141, 1969.

2258 **GRANULAR-CELL MYOBLASTOMA - AN UNUSUAL RECTAL NEOPLASM: REPORT OF A CASE.** *(E.)* Cohen, R. S. (Mercy Hosp., Denver, Colo.) and R. E. Cramm. *Dis Colon Rectum* 12(2):120-124, 1969.

2259 **NON-STAPHYLOCOCCAL PSEUDOMEMBRANOUS COLITIS. [CASE REPORT]** *(E.)* Gelfand,

I. D. (Wilford Hall USAF Hosp., Lackland Air Force Base, exas) and C. L. Krone. *Amer J Dig Dis* 14(4):278-281, 1969.

260 ANORECTAL FISTULA. *(Por.)* Magalhães, J. P. (Gen. Polyclin., Rio de Janeiro, Brazil). *Brasil led* 82(4):263-266, 1968.

261 DIVERTICULAR DISEASE OF THE COLON. *(Sp.)* Flórez Tascón, F. J. *Medicina (B Air)* 6(10):1323-1342, 1968.

262 DIVERTICULITIS OF THE COLON. *(Ger.)* Aeberhard, P. (Surg. Clin. A, U. Zurich, witzerland), S. Arma and A. Akovbiantz. *Langenbeck Arch lin Chir* 323(3):189-202, 1969.

2263 THE PACEMAKER AND ANORECTAL CONTINENCE. *(Fr.)* Colin, R. (Montpellier U. Iosp. Ctr., France), J. Cadilhac, J. Arrighi, J. Pous and R. Mace. *Iontpellier Chir* 14(3):371-379, 1968.

2264 TREATMENT OF THE ADJACENT COLON IN ANORECTAL PATHOLOGY: EFFICACY OF OLLOIDAL BISMUTH PHOSPHATE. *(Fr.)* Milstein, J. Lariboisiere Hosp., Paris, France). *Sem Ther* 44(10):650-653, 968.

2265 AN UNUSUAL CAUSE OF GASTROINTESTINAL BLEEDING: A CIRSOID ANEURYSM OF HE CECUM. *(Fr.)* Grenier, J. F., G. Sava, M. Gillet and Veill-Bousson. *Mem Acad Chir (Paris)* 94(27/28):761-767, 968.

2266 LEIOMYOSARCOMA OF THE RECTUM. *(E.)* Rukstinat, G. J. (Stritch Sch. Med., Loyola U., Chicago, Ill.). *J Abdom Surg* 11(3):55-56, 1969.

2267 KLEBSIELLA PSEUDOMEMBRANOUS ENTEROCOLITIS: REPORT OF TWO CASES. *(E.)* Murdoch, M. M. (Natl. Naval Med. Ctr., Bethesda, Md.), N. A. Janovski and S. Joseph. *Med Ann DC* 38(3):137-142, 1969.

2268 TREATMENT OF RECURRENT RECTAL CARCINOMA. *(E.)* Arminski, T. C. (Grace Hosp., Detroit, Mich.) and D. W. McLean. *J Abdom Surg* 11(2):38-43, 1969.

2269 REMARKS ON 247 SURGICAL CASES OF COLON CANCER: INITIAL RESULTS AND FOLLOW-UP. *(Gr.)* Kourias, V. (Greek Red Cross Hosp., Athens), E. Papaevangelou and A. Agorogiannis. *Acta Chir Hellen* 95(4):443-454, 1968.

2270 RADIATION THERAPY IN THE PALLIATIVE MANAGEMENT OF PATIENTS WITH RECURRENT CANCER OF THE RECTUM AND COLON. *(E.)* Whiteley, H. W., M. W. Stearns Jr., R. H. Leaming and M. R. Deddish. *Surg Clin N Amer* 49(2):381-387, 1969.

2271 ARTIFICIAL CONTROL OF THE ANAL COLOSTOMY IN SHEEP: *(E.)* Stanley, T. H. (U. Utah Coll. Med., Salt Lake City), T. R. Kessler, L. Wiseman and C. A. Blumle. *J Surg Res* 9(4):223-227, 1969.

2272 UNUSUAL RETRO-RECTAL TUMOR. [CASE REPORT] *(E.)* Skaggs, J. A. (Surg. Service, VA Ctr., Dayton, Ohio) and P. H. Guilfoil. *Amer J Proctol* 20(2):138-141, 1969.

2273 POLYPS OF THE COLON: A STATISTICAL REVIEW. *(E.)* Kellogg, C. S. (South Miami Hosp., Florida). *Amer J Proctol* 20(2):105-108, 1969.

2274 POLYPOSIS AND CANCER OF THE LARGE INTESTINE. *(It.)* Marcozzi, G. (Inst. Spec. Surg. Pathol., U. Rome, Italy). *Aggiorn Clinicoter* 10(2):1-73, 1969.

2275 SURGICAL PHYSIOLOGY OF THE COLON. *(E.)* Weigel, C. J. (River Forest, Ill.) *Amer J Proctol* 20(2):122-129, 1969.

2276 ABLATION PLASTIC TISSUE ADHESIVE HEMORRHOIDECTOMY. *(E.)* Cantor, A. J. (Flushing, N. Y.). *Amer J Proctol* 20(2):118-121, 1969.

2277 APPENDICOCECAL INTUSSUSCEPTION: A CASE REPORT. *(E.)* Krasna, I. H. (Montreal Child. Hosp., P. Q., Canada) and H. E. Beardmore. *Canad J Surg* 12(2):229-232, 1969.

2278 CALCIFIED LYMPH NODE METASTASIS FROM CARCINOMA OF THE RECTUM. [CASE REPORT] *(E.)* Rominger, C. J. (Misericordia Hosp., Philadelphia, Pa.), J. F. Centrone and L. J. Thompkins. *Amer J Surg* 117(3):410-412, 1969.

2279 GRANULOMATOUS COLITIS. CASE REPORTS. *(E.)* Tarkunde, V. B. (Mahatma Gandhi Mem. Hosp., Bombay, India) and V. J. Patankar. *Amer J Gastroent* 51(4):303-310, 1969.

2280 MUCOEPIDERMOID CARCINOMA OF THE ANUS. [CASE REPORT] *(E.)* Seidenverg, N. (Presbyterian Hosp., San Francisco, Calif.) and R. J. Kleinhenz. *Amer J Surg* 117(3):413-415, 1969.

2281 CANCER OF THE COLON AND RECTUM. *(Ic.)* Hallgrimsson, S. *Laeknabladid* 54(4):153-167, 1968.

2282 PERITONEAL INVOLVEMENT IN SCHONLEIN-HENOCH PURPURA: MESOCOLONIC APOPLEXY. *(Hun.)* Boros, G. (U. Med. Sci., Pecs, Hungary), Z. Balogh, J. Metzl and I. Nagy. *Orv Hetil* 110(11):613-617, 1969.

2283 RESULTS OF A COMPLEX STUDY OF BLOOD COAGULATION IN LOW SMALL INTESTINAL OBSTRUCTION. *(Rus.)* Liul'ko, A. V. (Dnepropetrovsk Med. Inst., USSR) and Ie. G. Slesarenko. *Klin Khir (Kiev)* (10):45-48, 1968.

2284 **LYMPHOSARCOMA OF THE APPENDIX IN A CHILD.** *(Rus.)* Martyniuk, N. A. (Ivano-Frankovsk Distr. Childr. Hosp., USSR), I. I. Bibliuk and N. A. Akimchenkov. *Klin Khir (Kiev)* (10):78-79, 1968.

2285 **CYSTS OF THE VERMIFORM APPENDIX.** *(Rus.)* Ismailov, A. Kh. (Blagoveshchensk Med. Inst., USSR), V. Ie. Priadko, I. I. Koshcher and V. M. Mironov. *Klin Khir (Kiev)* (10):77-78, 1968.

2286 **STRUCTURE AND ORIGIN OF INTESTINAL PIGMENT IN CASES OF MELANOSIS COLI.** *(Ger.)* Vogel, A. (Inst. Path., Free U. Berlin, Germany), W. Fabricius, H. J. Dulce and H. J. Stolpmann. *Virchow Arch Path Anat* 346(1):74-88, 1969.

2287 **FUNCTIONAL MEGACOLON.** *(Por.)* Pinheiro Magalhães, J. (Gen. Polyclin., Rio de Janeiro, Brazil). *Folha Med* 57(4):623-629, 1968.

2288 **PREOPERATIVE RADIATION FOR TREATING RECTUM CARCINOMA.** *(Jap.)* Kusumoto, G. (Kure Natl. Hosp., Hiroshima, Japan), T. Uryuhara, S. Kobayashi and K. Kirimoto. *Iryo* 22(11):1257-1261, 1968.

2289 **THE COEXISTANCE OF CANCER AND CROHN'S DISEASE.** *(Fr.)* Lagache, G. (Hosp. Ctr., Lille, France), J. Paris and A. Dupont. *Acta Chir Belg* 67(9):939-949, 1968.

2290 **PNEUMATOSIS CYSTOIDES INTESTINALIS.** *(Ger.)* Koch, G. (Inst. Radiol., U. Hamburg-Eppendorf, Germany), G. A. Schlosser and H. Wieners. *Bruns Beitr Klin Chir* 216(7):665-672, 1968.

2291 **PROLAPSE OF THE SIGMOID THROUGH THE ANUS.** *(Rus.)* Skobelkin, O. K. (Kalinin Med. Inst., USSR), N. I. Yakunichev and V. I. Sokolov. *Khirurgiia (Moskva)* 45(1):123-124, 1969.

2292 **HEMORRHOIDECTOMY: HANDLING MILLIGAN'S TRIANGLE WITH AN ELASTIC BAND.** *(Por.)* De Miranda, E. M. (Natl. Inst. Publ. Health, Rio de Janeiro, Brazil). *Folha Med* 58(1):61-72, 1969.

2293 **A SIMPLE, EFFECTIVE OPERATION FOR RECTAL PROLAPSE.** *(E.)* Ripstein, C. B. (Brookdale Hosp. Ctr., Brooklyn, N. Y.). *Postgrad Med* 45(3):201-204, 1969.

2294 **EFFICACY OF COMPLEX THERAPY IN PATIENTS SUFFERING FROM CHRONIC COLITIS AT THE ESSENTUKI RESORT.** *(Rus.)* Postoyan, A. D. (Polyclin. Essentuki Resort, USSR). *Vop Kurort Fizioter* 33(6):493-496, 1968.

2295 **POSTERIOR HEPATO-DIAPHRAGMATIC POSITION OF THE COLON.** *(Fr.)* Oancea, T. (Cent. Milit. Hosp., Bucharest, Rumania), O. Bocaneala and P. Popescu. *J Chir (Paris)* 96(6):547-552, 1968.

2296 **CONTINENCE IN PERINEAL COLOSTOMIES.** *(Fr.)* Orsoni, P. (Paris, France). *J Chir (Paris)* 96(6):519-528, 1968.

See also 2036,2053,2054,2165,2362

297 **THE PROGNOSIS FOR ULCERATIVE COLITIS.** *(Ger.)* Demling, L. (Med. Clin., U. Erlangen,
ermany), G. Hegemann, M. Classen and J. von der Emde.
eutsch Med Wschr 94(6):247-253, 1969.

n analysis was made of the histories of 277 hospitalized pa-
ents with ulcerative colitis who were treated between 1950-
967. During 1950-1954 the morbidity was at the upper
ormal limit for Europe, but between 1965-1967 the morbidity
most doubled. Between 1950-1954, 55% of the patients were
eated conservatively and between 1965-1967, 82%. In 157
ases symptoms first appeared between the ages of 20-39 yr.
ess than 20% of the patients were older than 49 yr. About
5% more women than men were affected. Symptoms were
ild in 38 cases, moderately severe in 131, and severe in 56.
uring the 1st attack 7 surgically treated and 2 conservatively
eated patients died for a total mortality of 11%. In the 1st
r after hospitalization the mortality was 9.7% and a maximum
f 3.2% per yr thereafter. After 14 yr the cumulative mortality
as almost 25%. Of the 48 patients who died, 17 were more
han 60 yr old, but ulcerative colitis was the cause of death in
nly 8 cases. The entire colon was involved in 14 of 34 autop-
ied cases. Life-threatening local complications included mas-
ive intestinal bleeding in 17 cases (6.1%), intestinal perforation
n 11 (4.0%), ileus in 9 (3.2%), toxic megacolon in 8 (2.9%),
nd carcinoma in 4 (1.4%).

298 **AN EPIDEMIOLOGICAL MODEL OF ULCERATIVE COLITIS.** *(E.)* Iversen, E. (Gentofte Hosp., Hellerup, Denmark), O. Bonnevie, P. Anthonisen and P. Riis. *Scand J Gastroent* 3(6):593-610, 1968.

Data for 231 cases of ulcerative colitis diagnosed in Copenhagen County during 1961-66 were fitted into a hypothetical epidemiological model for a chronic disease. It was estimated that, annually, 8.5 per 100,000 of the general population had the first symptoms of ulcerative colitis, while 7.3 per 100,000 had the disease diagnosed. The prevalence of undiagnosed cases in the County was found to be 41 per 100,000, and the prevalence of diagnosed cases was 109 per 100,000. The patients' mortality was three times higher than the general mortality.

2299 **TOXIC DILATATION OF THE COLON IN ULCERATIVE COLITIS.** *(Ger.)* Hörmann, D. (Radiol. Clin., Karl Marx U., Leipzig, Germany). *Deutsch Gesundh* 24(3):129-133, 1969.

2300 **CHRONIC ULCERATIVE COLITIS. A LIFELONG STUDY.** *(E.)* Bargen, J. A. (Riverside Med. Clin., Cal.). Springfield, Ill., C. C. Thomas, 1969. 123 pp.

2301 **SEGMENTARY ULCERATIVE COLITIS.** *(Sp.)* Etala, E. and L. M. Romero. *Bull Soc Int Chir* 27(5):393-401, 1968.

See also 2046

PANCREAS

2302 **CHANGES IN THE PANCREATIC DUCT SYSTEM: GROSS, MICROSCOPIC, AND CLINICAL STUDIES.** *(Ger.)* Adlung, J. (1st Med. Clin., Med. Acad. Lübeck, Germany), H. G. Gürich and U. Ritter. *Med Welt* 20(8):387-391, 1969.

Radiological and, in most cases, histological studies were made of the pancreatic duct system at autopsy in 62 randomly selected patients, aged 33-90 yr. None of these patients had a history of pancreatitis. Severe changes in the pancreatic duct system were found in 12 cases and slight changes in 10. The most frequent changes occurred in the main pancreatic duct followed by circumscribed and diffuse rarefactions in the accessory ducts. Histological evidence of fibrosis and sclerosis accompanied by lipomatosis was found in these areas. Other findings included epithelial metaplasia, papillary obstruction, and tubular hyperplasia. Cholelithiasis was present in 22 of these 62 patients, and cholelithiasis and choledocholithiasis were found in 5. Three patients with severe changes in the pancreatic duct system had choledocholithiasis, which was present in only 1 patient out of 40 with normal pancreatic ducts. Cholelithiasis was also present in a larger percentage of patients with severe changes than in those with no changes. All pathological changes were found in patients 61 yr of age or older, and the higher incidence of severe changes after 80 yr was statistically significant.

2303 **EXPERIMENTALLY INDUCED CHANGES IN THE PANCREAS AFTER CANNULATION AND LIGATION OF THE PANCREATIC DUCT.** *(Rus.)* Tuzhilin, S. A. (Inst. Nutrit. Acad. Med. Sci. USSR, Moscow), M. F. Nesterin, L. Ie. Zhurbin, I. I. Kniazev and V. A. Shaternikov. *Eksp Khir Anest* 13(6):22-24, 1968.

Insufficiency of Oddi's sphincter was induced in 5 dogs by inserting a cannula in the pancreatic duct so that duodenal juice could enter it. Blood amylase and trypsin activities were determined on these dogs, on 2 in which the pancreatic duct had been ligated and its end isolated with the omentum, and on 2 controls 10, 20, and 30 days after surgery. Trypsin activities were highest in cannulated dogs. Dogs with ligated pancreatic ducts had elevated blood amylase activities for 10 days which later returned to normal, while dogs with cannulas had gradually increasing amylase activities which reached a maximum at the end of the observation period. Cannulated dogs developed histological features of chronic pancreatitis with leukocyte infiltration in tissue between the lobules and acini, particularly near the pancreatic duct, and regional fibrosis, but the acini remained intact. Dogs with ligated pancreatic ducts had diffuse pancreatic fibrosis in which the acini were replaced by connective tissue. Cannulation of the pancreatic duct should provide a useful experimental model for the study of chronic pancreatitis.

2304 **THE EFFECT OF BROMELIN IN PANCREATOGENIC MALABSORPTION.** *(Ger.)* Kugener, H. (Med. Clin., U. Freiburg/Breisgau, Germany), D. Bergmann and K. Beck. *Z Gastroent* 6(6):430-433, 1968.

Nitrogen and fat balances were run on 8 patients with exocrine pancreatic insufficiency during treatment with the plant protease bromelin (200 mg t.i.d.). Even these large doses of bromelin did not improve absorption. During therapy the mean weight of the stools and mean fat excretion increased. Nitrogen excretion was not appreciably changed. Bromelin or impurities in the preparation might increase fat excretion by hydrolyzing pancreatin or act proteolytically on the intestinal mucosa to reduce fat absorption.

2305 **HYPOPLASIA OF THE EXOCRINE PANCREAS AND ASSOCIATED MYOENDOCARDIAL FIBROSIS IN ONE OF TWO OBSERVED BROTHERS.** *(Fr.)* Sacrez, R. (Fac. Med., Strasbourg, France), F. Klein, B. Hoffmann, J. M. Lévy, J. Geisert and R. Korn. *Ann Pediat (Paris)* 45(1):43-48, 1969.

2306 **CLOSED TRAUMA TO THE PANCREAS AND ITS SEQUELLAE.** *(Fr.)* Marchal, G., M. Balmes, M. Bousquet and G. Olivier. *Montpellier Chir* 14(3): 361-369, 1968.

2307 **RESECTION OF THE PANCREAS AND DUODENUM.** *(Heb.)* Tulcinsky, D. B. (Munic. Hosp., Tel-Hashomer, Israel) and A. Dinbar. *Harefuah* 75(10):419-421, 1968.

2308 **JAUNDICE, CANCER OF THE PANCREAS AND SURGERY.** *(Fr.)* Périssat, J., F. Lehmans and P. Gratadour. *Bordeaux Med* 2(2):371-374, 1969.

2309 **THE MANAGEMENT OF TRAUMA TO THE PANCREAS. [CASE REPORT]** *(E.)* Mule, J. E. (St. John's Episcopal Hosp., Brooklyn, N. Y.) and M. Adaniel. *Surgery* 65(3):423-426, 1969.

2310 **EXOCRINE PANCREATIC FUNCTION IN CHRONIC RENAL INSUFFICIENCY.** *(Ger.)* Wittich, K. A. (Med. Clin., U. Göttingen, Germany), H. Schmidt, F. Scheler and W. Creutzfeldt. *Verh Deutsch Ges Inn Med* 74:1072-1074, 1968.

2311 **TRAUMATIC RUPTURE OF THE PANCREAS (REVIEW OF PERSONAL EXPERIENCE).** *(Gr.)* Panagiotopoulos, I. (Gen. Hosp., Khalkis, Greece). *Acta Chir Hellen* 95(5):726-737, 1968.

2312 **TRANSVERSE INVAGINATING PANCREATICO-ENTEROSTOMY WITH SUBMERGED DRAINAGE.** *(Rus.)* Vitebskii, Ia. D. (Kurgan Distr. Hosp., USSR). *Klin Khir (Kiev)* (10):43-45, 1968.

2313 **CLINICAL ASPECTS AND TREATMENT OF PANCREATIC CYSTS.** *(Ger.)* Strahberger, E. (2nd Surg. Clin., U. Vienna, Austria). *Wien Klin Wschr* 81(11): 177-185, 1969.

2314 **PANCREATICODUODENAL CANCER.** *(Dan.)* Barlebo, H. (Gentofte Hosp., Copenhagen, Denmark A. Gammelgaard and F. R. Mathiesen. *Nord Med* 81(9):280-283, 1968.

15 **SURGICAL TREATMENT OF PANCREATIC PSEUDOCYSTS.** *(Cz.)* Paťcha, L. (Surg. Dept., st. Hlth. Syst., Prostějov, Czechoslovakia). *Cesk Gastroent vz* 23(1):26-31, 1969.

2316 **PANCREAS TRANSPLANT.** *(Por.)* Teizeira, D. (Silvestre Hosp., Rio de Janeiro, Brazil), R. Faria, G. Monteiro, R. Bandeira, M. Cenzo, T. Callichio and J. Rodrigues. *Folha Med* 57(4):49-53, 1968.

See also 2005,2039,2057,2058,2060,2490

2317 EXPERIMENTAL PANCREATIC DISEASE WITH AN IMMUNE BASIS. I. EFFECT OF ACTIVE IMMUNIZATION WITH PANCREATIC ANTIGENS.

(It.) Castrini, G. (Inst. Spec. Surg. Path., U. Perugia, Italy), P. Furiosi and M. Potestio. *Gazz Int Med Chir* 74(1):5-38, 1969.

Adult rabbits were given weekly injections of antigen prepared from the pancreatic homogenates of dogs, humans and cats, or complete Freund's adjuvant. Increases in antipancreas antibodies were demonstrated by the complement-fixation and passive hemagglutination tests in all groups except those receiving Freund's adjuvant. These antibodies were more or less specific for the antigen injected. Rabbits immunized with pooled homologous pancreatic antigen were shown to have 0-3 precipitation lines in the Ouchterlony agar precipitation test, suggesting that there are a number of pancreas-specific antigens which differ from one another immunologically. Pancreatic lesions seen 1.5 months after the beginning of immunization included chronic inflammation, edema of the perilobular spaces, hemorrhage, and some cellular infiltrates. After 2 months the lobular acini had become atrophic and occasional foci of cell necrosis were present. The liver and kidneys were not affected. Similar results were obtained with dogs given pooled homologous antigen. Partial pancreatectomies were performed on 10 rabbits and 5 dogs who were then given injections of their own antigen combined with Freund's adjuvant. None of the rabbits developed autoantibodies, but 3 of the dogs did. Immunofluorescent studies of tissue sections from immunized dogs showed that antibodies were present in pancreatic acinar cells but not in the endocrine pancreas.

2318 EXPERIMENTAL PANCREATIC DISEASE WITH AN IMMUNE BASIS. II. THE EFFECT OF PASSIVE TRANSFER OF ANTIPANCREAS ANTIBODIES.

(It.) Furiosi, P. (Inst. Spec. Surg. Path., U. Perugia, Italy), G. Castrini and M. Potestio. *Gazz Int Med Chir* 74(2):97-131, 1969.

A study was made of the effect of the passive transfer of antipancreas immune serum from rabbits when injected into rabbits, cats, and dogs. In rabbits, passive transfer of antipancreas serum had no effect on the pancreas or blood amylase activities. When preceded by s.c. injection of Freund's adjuvant, microscopic pancreatic lesions appeared after 24 hr and a simultaneous and significant increase occurred in blood amylase activities. When preceded by s.c. injections of homologous pancreatic homogenates the lesions, which were more pronounced than those in the preceding group, included vasodilation, hemorrhagic areas, leukocyte diapedesis, interstitial edema, areas of cellular necrosis, and mast-cell infiltrates. Blood amylase activities were increased. Similar, but more pronounced, histological changes were seen in all 3 groups of cats and in dogs given i.v. and i.a. injections. In dogs, lesions were most marked after i.a. injections, and amylase activities were elevated in all cases. No changes occurred in the pancreases of animals receiving injections of antiliver immune serum or normal rabbit serum. Immunization of pregnant rabbits with antipancreas serum had no effect on the fetal pancreas. Immunofluorescence studies in dogs and cats showed that antipancreas antibodies were present in acinar cells and, to a lesser extent, in the hepatic sinusoids.

2319 THE SIGNIFICANCE OF REFLUX IN THE PANCREATIC DUCT IN THE PRODUCTION OF LESIONS IN THE EXOCRINE PANCREAS: EXPERIMENTAL STUDY AND CLINICAL OBSERVATIONS.

(It.) Faggioli, F. (2nd Inst. Spec. Med. Path., U. Bologna, Italy), E. Roda, E. D'Annunzio, A. Venerato and M. Gnudi. *G Clin Med* 49(10):990-1013, 1968.

Electron microscope studies were made of biopsy material from 2 patients with radiological evidence of bile reflux into the pancreatic duct. In one of these patients with recurrent pancreatitis, observations were limited to acini in a region with no hemorrhagic lesions. The mitochondria were swollen and there were a large number of zymogen granules in the basal portion of the acinar cells. In the other patient, who had chronic atrophic pancreatitis, there were severe changes in the exocrine cells with accumulations of lipid material. Similarities between these observations and those made previously in dogs in which bile had been introduced into the accessory pancreatic duct suggest that the reflux of bile into the pancreatic duct is an important factor in the etiology of chronic pancreatitis.

2320 ACUTE PANCREATITIS: SHOULD CONSERVATIVE TREATMENT INCLUDE THE PROTEINASE INHIBITOR, TRASYLOL?

(Ger.) Scheibe, O. (Surg. Clin., Med. Acad. Lubeck, Germany) and E. Waller. *Med Welt* 20(8): 411-414, 1969.

The results of conservative treatment were compared in 270 patients, 112 of whom did not receive Trasylol and 72 of whom did. The mean age and sex ratio were about the same in these 2 groups. The mortality was 8% among patients who did not receive Trasylol and 11% among those who did. This difference is not significant. These findings are also compared with others in the literature. Because some patients developed alkalosis and low blood chloride concentrations due to aspiration of the stomach contents and inadequate inhibition of secretion with atropine, $NaHCO_3$ was not given to neutralize gastric acidity. Results of conservative therapy were much better than those of surgical treatment. Laparotomies were performed on 13 patients, 8 of whom did not have elevated diastase activities; 8 of these 13 patients died shortly after surgery.

2321 THE ROLE OF PHOSPHOLIPASE A IN THE COURSE OF ACUTE PANCREATITIS.

(Ger.) Wanke, M. (Inst. Path., U. Heidelberg, Germany), W. Nagel, M. M. Linder and H. Sebening. *Z Gastroent* 6(6):434-442, 1968.

Sodium taurocholate (0.6 ml of 0.4, 2, and 5% solutions), 250 μg of phospholipase A in 0.4% sodium taurocholate, 2% of lysolecithin in 0.6 ml of Ringer's solution, and 0.6 ml of pure olive oil were instilled into the pancreatic ducts of 70 male Wistar rats under hexobarbital anesthesia. Animals were then killed with an overdose of barbiturate and the pancreatic tissue was studied histologically. Sodium taurocholate produced mostly circulatory disturbances and, at higher concentrations, coagulation necrosis in the epithelium of the ducts and acini. The parenchyma broke down before enzyme activation, caused by hypoxia, could produce cell destruction. After 60 min, phospholipase A in 0.4% sodium taurocholate produced nall areas of parenchymal necrosis and infiltrates of poly- orphonuclear granulocytes, primarily around the blood ves- ls, interstitial edema, thrombi in necrotic areas, vacuolization f the acinar epithelium around necrotic areas, and zymogen xtrusion without acinar necrosis. After 5 min, lysolecithin roduced extensive interstitial edema and hyperemia. After -2 hr, hemolysis and endothelial necrosis increased and circula- on ceased. Finally, peripheral parenchymal necrosis and ecretory edema were observed together with areas of necrosis adipose tissue around the pancreas which were surrounded y granulocytes. Olive oil produced foci of digestion, cell estruction, eosinophilic degeneration after a decrease in basal asophilia, karyorrhexis and karyolysis. There were no circu- tory disturbances or vascular edema.

2322 **THE BEHAVIOR OF NONSPECIFIC PHOSPHATASES IN THE LIVER IN THE COURSE OF CUTE EXPERIMENTAL PANCREATITIS IN DOGS.** *(Pol.)* Gabryelewicz, A. (2nd Clin. Int. Dis., Acad. Med. Bialystok, oland), J. Popow, B. Musiatowicz and M. Paprocki. *Acta hysiol Pol* 19(3):359-366, 1968.

n 15 dogs in which acute pancreatitis was induced by injec- ion of bile incubated with trypsin into the pancreatic duct at pressure of 40-50 cm H_2O, histochemical studies of the alka- ine and acid phosphatase activity in samples of liver tissue taken after intervals of 4-24 hr revealed a marked rise, accompanied by a sharp rise in serum amylase activity (from 147.2 Wohlgemuth units before injection of bile to 680.4 U in 4 hr). The increase in hepatic phosphatase was almost completely prevented by administration of heparin (1.0-1.5 mg/kg) during induction of pancreatitis, and the serum amylase rose only from 120.8 U to 156.4 U in 4 hr. The role of fibrinolysis and blood coagulation in the initial phases of the development of acute experimental pancreatitis is discussed, and attention is called to the protective effect of heparin.

323 **EXPERIMENTAL ACUTE PANCREATITIS IN DOGS. I. HYPOTENSIVE EFFECT INDUCED Y PANCREATIC EXUDATE.** *(E.)* Amundsen, E. (Dept. urg. Res., Rikshospitalet, Oslo, Norway), E. Ofstad and P. O. Iagen. *Scand J Gastroent* 3(6):659-664, 1968.

new technique has been developed for drainage and collection f exudate sequestered through the pancreas during experimen- al acute pancreatitis in dogs. The exudate (0.03 ml diluted to ml with 0.1 M Tris HC1, pH 7.5, i.v.) produced hypotension n healthy dogs 10-15 sec after injection; this effect lasted for bout 30 sec. The exudate collected early during the ailment ad the most marked hypotensive effect. This effect could be locked by antazoline when 20 mg of this compound was nixed with the exudate prior to the injection. The hypotensive actor was not dialysable. The possible role of histamine re- ease for the observed hypotensive effect of exudate is discussed.

2324 **EXPERIMENTAL ACUTE PANCREATITIS IN DOGS. II. HISTAMINE RELEASE INDUCED BY PANCREATIC EXUDATE.** *(E.)* Ofstad, E. (Dept. Surg. Res., Rikshospitalet, Oslo, Norway), E. Amundsen and P. O. Hagen. *Scand J Gastroent* 4(1):75-79, 1969.

The correlation between the histamine-releasing ability, tested on suspensions of rat mast cells, and the hypotensive effect, tested on dogs, of exudate portions collected directly from the pancreas at various time intervals during the course of experimental acute pancreatitis in dogs, was studied. The histamine-releasing ability was strongest in the portions collected early during the ailment, as was the hypotensive effect. Heat-treatments influenced the hypotensive and the histamine-releasing effects in a similar way. Acidification to pH 3.0 or lower, followed by neutralization and dialysis, destroyed both the hypotensive and the histamine-releasing effect of the exudates. It is concluded that histamine release from mast cells may be involved in the causation of the hypotension which can be observed when pancreatic exudate is injected i.v. in healthy dogs.

2325 **HEPARIN AND PROTEASE INHIBITORS IN THE PREVENTION OF EXPERIMENTAL ACUTE PANCREATIC NECROSIS IN DOGS.** *(E.)* Gabryelewicz, A. (Med. Sch., Bialystok, Poland), S. Niewiarowski, J. Prokopowicz and J. Chlebowski. *Digestion* 2(1):7-16, 1969.

The protective action of protease inhibitors (Trasylol, IP-315), the synthetic antifibrinolytic agent (epsilon-aminocaproic acid) and heparin in the prevention of acute pancreatic necrosis was evaluated on the basis of serum amylase, histological examination and survival of 53 dogs. Heparin was found to be the most efficient agent in protecting dogs from pancreatic necrosis, the other protease inhibitors were much less effective. In dogs pretreated with heparin no elevation of fibrinogen level and no inhibition of fibrinolysis were observed. These changes were markedly expressed in control dogs with pancreatic necrosis and those receiving protease inhibitors. The total proteolytic activity of pancreas homogenates was investigated. A significant difference in the heparin-treated dogs in comparison with the controls was observed. Similar differences were obtained on testing acid phosphatase in both groups. Successful prevention of acute pancreatitis by heparin can also be explained as being due to the anti-clotting properties of this drug as well as to its action on the level of the pancreatic cell. It is also possible that heparin has a stabilizing effect on lysosomes, known to be the main source of hydrolases.

2326 **THERAPEUTIC EFFECT OF THE PROLONGED THORACIC DUCT LYMPH FISTULA IN PATIENTS WITH ACUTE PANCREATITIS.** *(E.)* Brzek, V. (Dept. Surg., Charles U., Hradec Králové, Czechoslovakia) and V. Bartoš. *Digestion* 2(1):43-50, 1969.

In 10 patients with acute pancreatitis and in 10 patients with cholelithiasis the thoracic duct was cannulated and a prolonged external drainage of the lymph was performed. Initial lymph flow, total volume of the lymph diverted, and the levels of lymph and blood serum amylase were measured. In patients with acute pancreatitis, the initial lymph flow, lymph and blood serum amylase were found to be significantly higher than those in cholelithiasis. In patients with acute pancreatitis, lymph amylase was significantly higher than blood amylase. Early in the course of acute pancreatitis, there was a considerable increase in lymph flow followed subsequently by a reduction. The prolonged external drainage of the thoracic duct resulted in a rapid improvement of the clinical picture. It is concluded that the thoracic duct lymph is an important pathway for the rise in blood serum enzymes in acute pancreatitis, and that by the external drainage of the thoracic duct a considerable amount of toxic substances originating in the necrotic tissues may be removed from the organism.

2327 **CAUSES OF HYPOCALCEMIA IN ACUTE PANCREATITIS.** *(E.)* Bernacki, E. (Bialystok Med. Sch., Poland). *Bull Pol Med Sci Hist* 12(1):23-30, 1969.

2328 **PANCREATITIS AND ACUTE RENAL FAILURE.** *(Ger.)* Figdor, P. P. (Urol. Clin., U. Vienna, Austria) and G. Wense. *Med Mschr* 22(10):453-454, 1968.

2329 **HEMATIN FORMATION AND PANCREATITIS.** *(E.)* Frey, C. F. (U. Michigan Med. Ctr., Ann Arbor), D. M. Bradley, J. Glore and J. Wanner. *J Surg Res* 9(2):73-78, 1969.

2330 **CHRONIC PANCREATITIS WITH MASSIVE ASCITES.** *(E.)* Polak, M. (Gen. Infirm., Clin. Hosp., U. São Paulo, Brazil) and L. C. M. França. *Digestion* 1(5):296-304, 1968.

2331 **IS MEDICAL OR SURGICAL TREATMENT PREFERABLE FOR NECROTIC HEMORRHAGIC PANCREATITIS?** *(Fr.)* Beraud, C., J. Périssat and J. Paccalin. *Bordeaux Med* 2(2):355-361, 1969.

2332 **THE DEVELOPMENT OF THE DUODENOGRAM IN CHRONIC AND RECURRENT PANCREATITIS TREATED BY LEFT CELIAC GANGLIONECTOMY AND SPLANCHNICECTOMY.** *(Fr.)* Mallet-Guy (Fac. Med., Lyon, France), P. Jacquemet, P. Braconnot and C. Partensky. *Arch Franc Mal Appar Dig* 57(11):933-948, 1968.

2333 **INDICATIONS AND TECHNIQUES OF THE SURGICAL TREATMENT OF CHRONIC PANCREATITIS.** *(Fr.)* Doutre, L. P. and D. Traissac. *Bordeaux Med* 2(2):363-368, 1969.

2334 **ACUTE AND CHRONIC PANCREATITIS.** *(Ger.)* Engelhart, G. (Med. Clin., U. Basel, Switzerland). *Landarzt* 44(34):1655-1662, 1968.

2335 **PANCREATITIS FROM A SURGICAL POINT OF VIEW.** *(Ger.)* Rossetti, M. (Surg. Clin., U. Basel, Switzerland). *Landarzt* 44(34):1649-1654, 1968.

2336 **THE SURGICAL TREATMENT OF ACUTE AND CHRONIC PANCREATITIS.** *(Ger.)* Sell, G. (Munic. Hosp., Karlsruhe, Germany) and M. Auerbach. *Aerztl Prax Bild* (4/5):108a-112, 1968.

2337 **TREATMENT OF PANCREATITIS FROM THE INTERNIST'S POINT OF VIEW.** *(Ger.)* Heinkel, K. *Aerztl Prax Bild* (4/5):112-114, 1968.

2338 **SUBACUTE AND CHRONIC PANCREATITIS, MASSIVE ASCITES AND SUBCUTANEOUS FATTY NECROSIS. A REPORT OF 2 CASES AND REVIEW OF THE LITERATURE.** *(Fr.)* Debray, C. (Bichat Hosp., Paris, France), J. P. Hardouin, J. Leymarios, B. Gouin, R. Modibliani and C. Marche. *Sem Hop Paris* 45(13):827-839, 1969.

2339 **DUODENOPANCREATECTOMY FOR ACUTE NECROTIZING PANCREATITIS. [CASE REPORT]** *(Fr.)* Edelmann, G. (Pitié Hosp., Paris, France). *Acta Chir Belg* 67(9):906-914, 1968.

See also 2059

LIVER AND BILIARY TRACT
GENERAL

2340 LIVER TRANSPLANTATION IN MAN–II, A REPORT OF TWO ORTHOTOPIC LIVER TRANSPLANTS IN ADULT RECIPIENTS. *(E.)* Calne, R. Y. (Addenbrooke's Hosp., Cambridge, England), R. Williams, J. L. Dawson, I. D. Ansell, D. B. Evans, P. T. Flute, P. M. Herbertson, V. Joysey, G. H. W. Keates, R. P. Knill-Jones, S. A. Mason, P. R. Millard, J. R. Pena, B. D. Pentlow, J. R. Salaman, R. A. Sells and P. A. Cullum. *Brit Med J* 4(5630): 541-546, 1968.

Detailed case reports are presented for 2 patients (41-yr-old man and 46-yr-old woman) with primary hepatic malignancy who were treated by hepatectomy and orthotopic liver transplantation. In both cases the donor liver (from children, aged 5 and 13 yr, who had died of mumps encephalitis and a head injury, resp.) was infused with cold solutions and kept chilled without continuous perfusion. There was immediate satisfactory hepatic function in both transplants. The woman died after 11 weeks from overwhelming bacterial and fungal infections, probably secondary to hepatic infarction due to thrombosis of the recipient hepatic artery. The thrombus occurred at the site of the arterial clamp. In an attempt to control the growth before transplantation, the patient had been treated with large doses of chlorambucil, which resulted in extreme marrow depression and septicemia. The man developed cholestatic jaundice during the second and third weeks after transplantation, with histological evidence of mild rejection, which was controlled by increasing the dose of immunosuppressive agents. He is now well, having returned to work 6 weeks after the operation.

2341 IMMUNOSUPPRESSIVE THERAPY IN CHRONIC HEPATITIS AND HEPATIC CIRRHOSIS. *(Ger.)* Evers, C. (North Sea Clin., Westerland/Sylt, Germany), R. D. Hesch and D. Banzer. *Med Welt* 20(8):415-421, 1969.

Azathioprine (150 mg/day for 8 weeks) was given to 51 patients (31 men and 20 women) with chronic hepatitis or cirrhosis. These patients were selected on the basis of their high serum γ-globulin levels. Patients with acute jaundice were always treated with glucocorticoids before being given azathioprine. After 8 weeks of therapy γ-globulin levels were reduced in 32 patients and increased in 3. Initially elevated total serum protein levels, present in 37 cases, were reduced. No changes occurred in the remaining 14 patients whose total serum protein levels had been normal initially. No significant changes occurred in β-globulins. SGOT, SGPT, alkaline phosphatase, and serum bilirubin values decreased or returned to normal after therapy in almost all cases in which they had been initially elevated. Computer analysis of the data showed that azathioprine gave the best results when γ-globulin values ranged from 29-40%, SGOT activities from 20-40 U, and SGPT activities from 40-80 U. Common histological findings in these patients were dense round-cell infiltrations and hyperplasia of the reticuloendothelial system with frequent boundary layers and enlarged periportal fields. Only 3 patients developed leukopenia with leukocyte counts below 3000; therapy had to be discontinued in 2 cases because of this. None of these patients had platelet counts below 30,000.

2342 BEHAVIOR OF SOME PYRUVIC ACID METABOLITES IN THE BLOOD OF PATIENTS WITH VIRAL HEPATITIS AND HEPATIC CIRRHOSIS AND IN HEPATIC COMA. *(It.)* Gioannini, P. (Inst. Gen. Med. Clin., U. Sienna, Italy), G. Scalise, L. Pippi and C. A. Boggiano. *Minerva Med* 60(12):524-536, 1969.

Acetoin and 2,3-butylene glycol were determined in venous blood from 16 normal controls, 17 patients with viral hepatitis, 12 with cirrhosis, 10 in hepatic coma, and 5 with impending comas. The mean concentrations of these substances were highest in patients in hepatic coma followed by those with cirrhosis and were lowest in patients with viral hepatitis. Analysis of variance showed that the differences between these mean concentrations were statistically significant. In 3 of 6 patients with hepatic coma there was a definite parallelism between blood levels of acetoin and 2,3-butylene glycol and the neuropsychiatric symptoms. In 2 cases blood acetoin levels paralleled the clinical course while 2,3-butylene glycol concentrations did not change appreciably during the period of observation. Increases in the blood levels of acetoin and 2,3-butylene glycol were always accompanied by increases in the levels of pyruvic and lactic acids, but no clear-cut correlations could be demonstrated. It is suggested that acetoin and 2,3-butylene glycol might be responsible for neuropsychiatric symptoms in hepatic coma.

2343 HEPATIC CHANGES IN HYPERCHLORHYDRIC DYSPEPSIA. *(It.)* Carmenini, G. (Inst. Gen. Med. Clin., U. Rome, Italy), V. Di Giacomo, P. Soccorsi, A. Sciacca, M. Tenna and M. Testa. *Fegato* 14(3):305-312, 1968.

Of 194 patients with hyperchlorhydric dyspepsia, 91 (46.9%) had hepatomegaly, 47 (24.2%) had changes in serum proteins, 38 (19.5%) had abnormal Kunkel tests, 52 (26.8%) had abnormal urobilin values, and 2.5% had high blood bilirubin levels. Biopsies, performed on patients with signs of liver involvement, commonly showed dilatation of Disse's spaces with proliferation of reticuloendothelial cells as is seen in serous hepatitis, small intralobular infiltrates of lymphoid and reticular cells, mild steatosis, pleiocytosis of the portobiliary spaces accompanied by sclerosis and granulomatous changes, slight signs of degeneration, and excessive quantities of pigment. No relation was found between the severity of inflammatory changes in the liver and the duration and severity of the dyspepsia. Steatosis and pigmentation were most pronounced in patients with enzyme deficiencies, particularly deficiencies of pancreatic enzymes. These findings are similar to those seen in ulcer patients and are not specific in nature.

2344 SOME CHARACTERISTICS OF HEMODYNAMIC CHANGES FOUND IN CHRONIC HEPATITIS. *(Fr.)* Voiculesco, A. (Inst. Labor Evaluation Rehabilitation, Bucharest, Romania), S. Chifiriuc, I. Bistreanu and E. Istratescu. *Fegato* 14(4):533-542, 1968.

Studies were made of 33 patients who developed chronic hepatitis as a sequela of viral hepatitis. These included 12 with mild forms, 9 with moderately severe forms, and 12 with incipient cirrhosis. There was a tendency for systolic pressure to remain the same, diastolic pressure to decrease and the pressure differential and heart rate to increase. These changes became more pronounced as the disease progressed. Increases also occurred in the systolic volume and cardiac output, the cardiac index, and the volume of the peripheral pulse. Peripheral resistance and elastic resistance decreased. These changes are attributed to vasodilators which the liver cannot metabolize.

2345 STUDY OF LIVER FUNCTION WITH BROMOSULFOPHTHALEIN CLEARANCE IN PATIENTS WITH PEPTIC ULCERS AND A COMPARISON WITH OTHER RESEARCH METHODS. *(It.)* Romeo, S. (Inst. Surg. Symptomatol., U. Catania, Italy), A. Bordi and G. Gruttadauria. *Fegato* 14(3):399-403, 1968.

A comparison was made of BSP clearance and other liver function tests in 30 patients (13 men and 7 women, aged 20-78 yr) with peptic ulcers. Stomach ulcers were present in 11 and duodenal ulcers in 19. BSP clearance was abnormal and the Hanger and MacLagan tests were positive in 4 patients who had negative Takata-Ara tests. BSP clearance was abnormal in 7 patients, hypoproteinemia was present in 4, and bilirubin levels were increased in only 1. Liver involvement was most prevalent among patients with ulcers in the 1st part of the duodenum. This is probably due to vagal hypertonus which produces spasms in Oddi's sphincter with resultant disorders in biliary dynamics, changes in the production of cholecystokinin secondary to abnormalities in gastric secretion, and possible inflammation of the biliary tract and liver parenchyma.

2346 CHANGES IN GLUCOSE, PYRUVIC ACID, AND NONESTERIFIED FATTY ACIDS AFTER INTRAVENOUS ADMINISTRATION OF TOLBUTAMIDE TO PATIENTS WITH FATTY LIVER. *(Ger.)* Teichmann, W. (1st Med. Clin., Martin Luther U., Halle-Wittenberg, Germany) and U. Burchardt. *Deutsch Z Verdau Stoffwechselkr* 28(2/4): 217-220, 1968.

Blood levels of nonesterified fatty acids, glucose, and pyruvic acid were determined at various intervals 15-120 min after i.v. administration of 1.0 g of tolbutamide to 17 patients with fatty liver and to 8 normal controls. In patients with fatty liver glucose levels did not decrease as rapidly and did not return to their initial values as rapidly as in controls. Nonesterified fatty acid levels, which were almost double control values in patients with fatty liver, decreased as much as 70% and returned to their initial levels more slowly than in controls. There were no appreciable differences between changes in pyruvic acid levels in controls and patients with fatty liver. Similar changes seen in diabetes and obesity indicate that these diseases are closely related to fatty liver. Tolbutamide is recommended for the treatment of fatty liver because of the great reduction it produces in the blood levels of nonesterified fatty acids.

2347 GENETIC ASPECTS OF CHRONIC NONHEMOLYTIC FAMILIAL JAUNDICE (THE ROTOR SYNDROME) WITH CONJUGATED BILIRUBIN IN THE SERUM. *(Rum.)* Kaszá, L. (Inst. Med. Pharm., Tîrgu Mureş, Romania), E. Márer, D. Szilágyi, P. Székely and M. Makai. *Med Intern (Bucur)* 20(7):825-832, 1968.

Physical and urine examinations and tests for serum bilirubin, BSP retention, SGPT activity, and dysproteinemia were performed on 68 members of 3 families in which there was 1 case each of Rotor's syndrome. Subjects with abnormal findings were also subjected to serum electrophoresis and, in some cases, i.v. cholecystography. Biochemical abnormalities were found in 16 subjects (7 females and 9 males, all over 8 yr old), and 1 new case was diagnosed in an 8-yr-old niece of 1 of the patients. All 16 subjects with abnormal biochemical findings were asymptomatic and had normal liver function and no evidence of urinary bilirubin. Serum bilirubin levels ranged from 1.00-1.90 mg%, and BSP retention was moderate (5-12% after 45 min). Opacification of the gallbladder was seen in all subjects on whom i.v. cholecystography was performed. One or both parents of each patient had biochemical abnormalities. The parents of 1 patient were consanguineous.

2348 AN EXPERIMENTAL STUDY OF EXTRACORPOREAL PERFUSION OF THE LIVER. *(Pol.)* Nielubowicz, J. (Ctr. Exp. Clin. Med., Polish Acad. Sci., Warsaw, Poland), W. Olszewski, W. Rowiński, D. Bulien, J. Gruchalski, Z. Machowski, E. Mayzner, J. Polański, S. Pluciński, J. Sokolowski, M. Skośkiewicz and J. Szmidt. *Pol Przegl Chir* 49(1):1-9, 1969.

Extracorporeal perfusion of the liver, using a homologous donor animal, was carried out for 2-4 hr in 12 pigs with experimentally induced acute hepatic insufficiency, and liver function was compared with that in 6 control pigs subjected to acute hepatic insufficiency alone. Bile secretion, oxygen uptake and blood flow through the isolated perfused liver was maintained at normal levels for up to 3 hr. Exogenous ammonia and BSP clearance (below 33%) were accomplished in 20-30 min, and were independent of blood flow. However, the arterial blood pressure gradually dropped during perfusion and metabolic acidosis developed, accompanied by a decrease in serum proteins and an increase in SGOT and SGPT levels.

2349 THE PRINCIPAL ANOMALIES IN THE ARTERIAL VASCULATURE OF THE LIVER (AN ANGIOGRAPHIC STUDY). *(It.)* Blasucci, E. (1st Clin. Gen. Surg., U. Rome, Italy), R. Picchiotti and A. Trenti. *Chir Gastroent* 2(3):267-278, 1968.

Based on a review of the angiograms in 150 cases subjected to hepatic or abdominal surgery, it is concluded that the most common anomalies in the hepatic circulation are the presence of a right hepatic artery derived from the superior mesenteric (8%) and a left hepatic artery derived from the left gastric (6.6%). The latter anomaly corresponds to the accessory hepatic artery of Hyrtl. Normally, in about 55% of all cases, the hepatic artery arises in the celiac tripod and gives rise to the pyloric and gastroduodenal arteries, after which it splits into the right and left hepatic arteries; while the right branch immediately divides into two trunks which supply branches to the 5th, 6th, 7th and 8th segments, the left branch first gives rise to a single branch supplying the 4th segment, and then divides into further branches supplying the 1st, 2nd, and 3rd segments. Various modifications in the points of origin of the different terminal branches are possible. The embryological development of the hepatic circulation is reviewed and some of the surgical problems created by these circulatory anomalies are discussed.

2350 STUDIES ON THE INDICATIONS FOR PORTACAVAL SHUNT IN PATIENTS WITH PORTAL HYPERTENSION. *(Ger.)* Bucher, H. (Dept. Clin. Pharmacol.,

J. Bern, Switzerland), W. A. Fuchs, J. Tauber, H. Rosler and R. Preisig. *Schweiz Med Wschr* 99(7):229-238, 1969.

In 29 patients (21 men and 8 women, 23-70 yr old, including 18 with a history of alcoholism, 15 with gastrointestinal hemorrhage, 20 with esophageal varices and 13 with ascites) admitted with a diagnosis of cirrhosis (confirmed by biopsy in 19 cases) and portal hypertension during a 14-month period, the hepatic blood flow was evaluated using indocyanine green, the wedged hepatic venous pressure was measured, the liver volume and spleen size were assessed by scintillation scanning after administration of radiogold, and liver function was studied using BSP, galactose, serum bilirubin and albumin, and the serum enzymes. In addition, selective angiography of the celiac and mesenteric arteries was used to evaluate the splanchnic vascular architecture and the patency of the splenic and portal veins. Although portal hypertension was established in all cases, the hepatic blood flow was normal in 9. Despite the reduced functional capacity demonstrated by the results of the BSP and galactose tests, it was expected that these patients would tolerate the reduction in hepatic blood flow caused by a portacaval shunt. The other 20 patients had a more severe reduction in hepatic function with widely varying hepatic blood flows. Using an "index of perfusion" defined as the ratio between the liver blood flow and the hepatic volume, a further group could be delineated in whom a shunt could be expected to produce ischemia with resultant fatal hepatic failure. Although there was no information available as to the relative importance of hepatic arterial and portal venous inflows, retrograde filling of the hepatic from the mesenteric artery via the pancreatic arch was demonstrated angiographically in some of these patients. It is concluded that quantification of hepatic hemodynamics and function can serve as a rational basis for the selection of cirrhotic patients for shunt surgery.

2351 A STUDY OF FOUR PATIENTS WITH ISOLATED BROMSULFONPHTHALEIN RETENTION. *(Fr.)* De Groote, J. (St. Rafael Acad. Hosp., Louvain, Belgium), C. Ramboer, J. Versieck and F. Barbier. *Rev Int Hepat* 18(6):833-844, 1968.

A detailed analysis is presented of 4 patients (3 men and 1 woman, 25-56 yr old) in whom pathological values of BSP retention (28-34%, 12-24%, 10-20% and 22-30%, resp.) 45 min after the i.v. injection of a standard dose of 5 mg/kg were obtained in the absence of any alteration in hepatic function or structure. Two cases showed only a slight disturbance in BSP metabolism, but one showed reduced BSP transport with a normal storage capacity, as well as a defect in hepatic acetylation, while the 4th patient had normal BSP transport with a markedly decreased storage capacity and a defect in the conjugation of BSP with glutathione. The mother of one subject also showed pathological BSP retention (15%), with reduced BSP conjugation and decreased storage capacity. Although the precise etiology of this anomaly is unknown, an enzyme deficiency, which may well be hereditary, is postulated. The syndrome is comparable, in relation to BSP, to Gilbert's disease for bilirubin metabolism.

2352 DECREASED INSULIN PRODUCTION, ELEVATED GROWTH HORMONE LEVELS, AND GLUCOSE INTOLERANCE IN LIVER DISEASE. *(E.)* Hernandez, A. (New York U. Sch. Med., N. Y.), E. Zorrilla and H. Gershberg. *J Lab Clin Med* 73(1):25-33, 1969.

Oral glucose tolerance was investigated in 14 patients with liver disease and in whom i.v. galactose tolerance was used in a measure of liver function. Impairment of glucose tolerance was found in 1 of 5 patients with hepatitis and in 6 of 9 with cirrhosis. Impairment was closely correlated with impairment of galactose tolerance. Blood glucose and immunoreactive insulin levels during glucose tolerance in the 14 patients were correlated. Immunoreactive insulin levels were the same as in normal subjects but occurred at higher blood glucose levels. The linear regression of immunoreactive insulin on blood glucose revealed that for similar increments in blood glucose, liver disease patients had less increase in immunoreactive insulin than that in normal subjects or diabetic patients with the same blood glucose levels. In cirrhotic subjects with clinical hyperestrogenism fasting immunoreactive growth hormone was elevated and did not decrease normally after glucose administration. Galactose i.v. alone decreased these levels and appeared to potentiate the effect of glucose on growth hormone. Fasting free fatty acid levels were also elevated and did not decrease normally after glucose administration. In hepatitis growth hormone and free fatty acid levels were normal. Maturity-onset diabetic persons with the same degree of impairment of glucose tolerance had normal galactose tolerance. Impaired glucose tolerance in liver disease is related to the degree of liver damage and is associated with decreased insulin production. Elevated growth hormone and free fatty acid levels do not correlate with glucose intolerance. The impaired insulin production might be explained by a deficiency in the intestinal or hepatic factors that stimulate insulin secretion during carbohydrate absorption.

2353 CHANGES IN COAGULATION AND FIBRINOLYSIS AFTER ORTHOTOPIC CANINE LIVER HOMOTRANSPLANTATION. *(E.)* Pechet, L. (Denver VA Hosp., Colo.), C. G. Groth and P. M. Daloze. *J Lab Clin Med* 73(1):91-102, 1969.

Coagulation and fibrinolysis were studied in 22 dogs subjected to orthotopic liver homotransplantation. In 16 experiments the organs were transplanted promptly. In 6 others, the livers were first preserved *in vitro* for 24 hr. The following changes took place during the operations: A decrease in clotting factors I, II, VII, VIII, IX, X, a decrease in platelets, and excessive fibrinolysis. These abnormalities were not prevented by EACA and protamine, nor by heparin. The degree and duration of the abnormalities appeared to be related to the functional integrity of the homograft. In dogs receiving damaged livers, the abnormalities were severe and persisted after homograft revascularization; the animals died from uncontrollable bleeding. Recipients of adequately preserved livers showed only moderate and reversible changes, and no excessive bleeding occurred. The abnormalities observed were interpreted as resulting from consumption coagulopathy accompanied by pathologic fibrinolysis.

2354 AMEBIC ABSCESS OF THE LIVER. [EDITORIAL] *(E.)* Juniper, K. Jr. *Amer J Dig Dis* 14(4):290-292, 1969.

2355 TREATMENT OF HEPATIC COMA. *(E.)* Spellberg, M. A. (U. Illinois Sch. Med., Chicago). *Amer J Gastroent* 51(2):118-128, 1969.

2356 EXCHANGE TRANSFUSIONS IN THE TREATMENT OF FULMINANT HEPATITIS AND COMA. *(E.)* Durden, W. D. Jr. (Tripler Gen. Hosp., Honolulu, Hawaii), A. W. Siemsen and W. A. Briggs. *Amer J Gastroent* 51(2):129-137, 1969.

2357 CONGENITAL HEPATIC FIBROSIS. *(Fr.)* Benhamou, J. P., B. Antoine, C. Debray, C. Nezelof, M. Roux, J. M. Watchi and H. Pequignot. *Presse Med* 77(5):167-169, 1969.

2358 HEMOCHROMATOSIS AND MEGALOBLASTIC ANEMIA CURABLE BY FOLIC ACID. *(Fr.)* Bel, A. (Red Cross Hosp., Lyon, France), R. Alary, R. Dietsch and M. Girard. *Arch Franc Mal Appar Dig* 57(11):893-908, 1968.

2359 DIAGNOSTIC, CLINICAL AND HISTOPATHOLOGICAL PROBLEMS IN CONGENITAL ATRESIA OF THE BILE DUCTS. *(It.)* Fundaro, P. (Inst. Anat. Path. Histol., U. Milan, Italy). *Folia Hered Path (Milano)* 17(2):65-80, 1968.

2360 PRIMARY CARCINOMA OF THE LIVER. *(Ser.)* Dojčinov, D. (Inst. Path., Fac. Med., Niš, Yugoslavia), D. Stojanović and S. Petrović. *Med Pregl* 21(9/10):381-386, 1968.

2361 ICTERUS IN THE NEONATAL PERIOD. *(Fr.)* De Meyer, R. (Child. Med. Svc., Saint Raphael Clin., Louvain, Belgium). *Louvain Med* 87(9):673-684, 1968.

2362 A CORRECTOR OF BACTERIAL METABOLISM IN THE COLON: A MODERN TREATMENT OF PORTACAVAL ENCEPHALOPATHY. *(Fr.)* Lande, M. (Cochin Hosp., Paris, France) and C. Clot. *Sem Ther* 44(10):672-674, 1968.

2363 STUDY OF ORNITHINE ALPHA-KETOGLUTARATE IN HEPATIC DISEASE. *(Fr.)* Bertho, J. M. (Lagny Hosp., France), J. Bertho and P. Jacob. *Clinique (Paris)* 64(651):79-82, 1969.

2364 TREATMENT OF HYPERLIPEMIA AND HEPATIC STEATOSIS WITH LARGE DOSES OF MESO-INOSITOL HEXANICOTINATE. *(Fr.)* Neuman, M. (Cochin Hosp., Paris, France), M. Cachin, F. Pergola, P. Galian and A. Charbonnier. *Sem Ther* 44(10):660-663, 1968.

2365 DOUBLE PERIPHERAL CHOLANGIOJEJUNOSTOMY (RIGHT AND LEFT) IN THE TREATMENT OF PRIMARY CANCER OF THE INTRAHEPATIC BILE DUCTS. *(Fr.)* Prioton, J. B. (Surg. Clin. B, Montpellier, France), J. N. Bernard and B. Serrou. *Montpellier Chir* 14(3):317-335, 1968.

2366 PRIMARY LIVER TUMORS IN CHILDREN. *(Ger.)* Graser, F. (Munic. Pediat. Clin., Wiesbaden, Germany). *Praxis* 57(49):1715-1719, 1968.

2367 THE SURGICAL TREATMENT OF OBSTRUCTIVE JAUNDICE IN CHILDREN. *(Ger.)* Hasse, W. (Surg. Clin., Free U. Berlin, Germany). *Praxis* 57(49):1733-1735, 1968.

2368 PRESYMPTOMATIC AND HEPATIC FORMS OF WILSON'S DISEASE IN CHILDREN: LONG-TERM THERAPY WITH D-PENICILLAMINE. *(Ger.)* Kittoe, K. (Pediat. Clin., U. Bern, Switzerland) and J. P. Colombo. *Praxis* 57(49):1723-1729, 1968.

2369 SURGICAL TREATMENT OF PRIMARY LIVER CANCER. *(E.)* Ong, G. B. (Dept. Surg., U. Hong Kong) and C. H. Leong. *J Roy Coll Surg Edinb* 14(1):42-55, 1969.

2370 COMMON MECHANISMS OF HYPOTENSION IN IRREVERSIBLE SHOCK AND LIVER TRANSPLANTATION. *(E.)* Fonkalsrud, E. W. (UCLA Sch. Med., Los Angeles, Calif.). *Surg Gynec Obstet* 128(3):601-602, 1969.

2371 PORTACAVAL ANASTOMOSIS IN RATS: TECHNIQUE, RESULTS AND EXPERIMENTAL APPLICATION. *(Gr.)* Tierris, E. (Royal Infirm., Bristol, England) and G. Brown. *Acta Chir Hellen* 95(5):658-668, 1968.

2372 MULTIPLE LIVER ABSCESSES CAUSED BY *YERSINIA ENTEROCOLITICA*. *(Fl.)* Bloquiaux, W. *T Gastroent* 11(6):578-583, 1968.

2373 PORTAL HYPERTENSION IN CHRONIC LIVER DISEASES AND ITS TREATMENT. *(Ger.)* Weinreich, J. (Med. Acad., Lubeck, Germany). *Med Mschr* 23(2):56-60, 1969.

2374 DOWN'S SYNDROME (MONGOLISM). ELECTRON MICROSCOPE STUDIES OF THE LIVER. 3RD REPORT. *(Ger.)* Saxl, O. (Res. Inst. Pediat., Brno, Czechoslovakia), J. Tichy and O. Štouračová. *Z Gastroent* 6(6):407-413, 1968.

2375 THE DIAGNOSIS, DIFFERENTIAL DIAGNOSIS, AND TREATMENT OF ECHINOCOCCUS CYSTICUS AND ECHINOCOCCUS ALVEOLARIS. *(Ger.)* Loew, D. (Munic. Hosp., Rüsselsheim, Germany) and K. Hill. *Zbl Chir* 93(51):1766-1776, 1968.

2376 ACUTE LIVER INSUFFICIENCY (HEPATIC COMA). *(Sp.)* Katz Ugarte, R. (Fac. Med., Santiago, Chile). *Arq Gastroent* 6(1):41-46, 1969.

2377 CYSTIC DEGENERATION OF THE LIVER: SIGNIFICANCE OF RADIOLOGICAL AND ENZYMOLOGICAL STUDIES. *(Pol.)* Mroczek H. (Distr. Hosp., Bialystok, Poland) and L. Chwieroś. *Pol Tyg Lek* 24(10):371-372, 1969.

2378 **EXPERIENCE WITH EXCHANGE TRANSFUSION IN THE TREATMENT OF HEPATIC COMA.** *E.)* Tytgat, G. (Dept. Med., U. Louvain, Belgium), J. Piessens, D. Collen and J. De Groote. *Digestion* 1(5):257-266, 1968.

2379 **A STUDY ON CHEMOTHERAPY OF EXPERIMENTAL LIVER CANCER WITH MITOMYCIN C: COMPARISON BETWEEN THE EFFECT OF INTRA-ARTERIAL AND INTRA-PORTAL INJECTION.** *(E.)* Kato, H. (Kyoto U. Med. Sch., Japan). *Arch Jap Chir* 38(1):171-187, 1969.

2380 **HISTOLOGICAL DIAGNOSIS OF ACUTE CHOLESTASIS.** *(E.)* Scheuer, P. J. (Royal Free Hosp., London, England). *Arq Gastroent* 6(1):17-19, 1969.

2381 **CHANGES OF NUCLEAR RNA IN HEPATOMAS AS REVEALED BY RNA/DNA HYBRIDIZATION.** *(E.)* Chiarugi, V. P. (Inst. Gen. Path., U. Florence, Italy). *Biochim Biophys Acta* 179(1):129-135, 1969.

2382 **CLINICAL PHARMACOLOGICAL STUDIES ON DRUG ABSORPTION IN LIVER DISEASES.** *Ger.)* Schmid, E. (1st Med. Clin., Med. Acad., Lübeck, Germany) . Adlung, G. Fricke and G. Stoffels. *Verh Deutsch Ges Inn Med* 74:1138-1140, 1968.

2383 **NONPARASITIC CYSTS OF THE LIVER: REPORT OF THREE CASES.** *(E.)* Belcher, H. V. U. S. Publ. Hlth. Svc. Hosp., Baltimore, Md.) and H. C. Hull. *Surgery* 65(3):427-431, 1969.

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2385 **PORTACAVAL SHUNT IN THE TREATMENT OF GLYCOGEN STORAGE DISEASE: REPORT OF A CASE.** *(E.)* Hermann, R. E. (Cleveland Clin. Found., Ohio) and R. E. Mercer. *Surgery* 65(3):499-503, 1969.

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2387 **THE RELATION BETWEEN POSITIVE LATEX TESTS FOR "RHEUMATOID FACTOR" AND SERUM MACROGLOBULINS IN CHRONIC LIVER DISEASES.** *Ger.)* Weinreich, J. (1st Med. Clin., Med. Acad., Lübeck, Germany) and G. Eckert. *Verh Deutsch Ges Inn Med* 74:909-911, 1968.

2388 **BIOLOGICAL TRANSPORT MECHANISMS IN HYPERBILIRUBINEMIA.** *(Ger.)* Gross, W. (Med. Polyclin., U. Würzburg, Germany), J. Voss and B. Wameling. *Verh Deutsch Ges Inn Med* 74:1143-1145, 1968.

2389 **PRELIMINARY RESULTS FROM IMMUNOSUPPRESSIVE THERAPY IN CHRONIC LIVER DISEASES.** *(Ger.)* Perings, E. (Med. Clin., U. Göttingen, Germany), W. Hunstein, and W. Creutzfeldt. *Verh Deutsch Ges Inn Med* 74:894-897, 1968.

2390 **THE SIGNIFICANCE OF THE LIVER IN HIGH BLOOD LACTATE LEVELS IN SHOCK.** *(Ger.)* Schröder, R. (2nd Med. Clin., Free U., Berlin, Germany), W. K. Eltringham, J. R. Gumpert, M. E. Jenny, J. R. Pluth and R. M. Zollinger, Jr. *Verh Deutsch Ges Inn Med* 74:886-890, 1968.

2391 **SPECIFIC CHANGES IN HEMATOPOIESIS IN PATIENTS WITH CHRONIC LIVER DISEASES.** *(Ger.)* Strohmeyer, G. (Med. Clin., Philipps U., Marburg/Lahn, Germany) and H. Kuni. *Verh Deutsch Ges Inn Med* 74:622-623, 1968.

2392 **IMMUNOLOGICAL AND BIOCHEMICAL STUDIES ON TISSUE ANTIGENS FROM THE HUMAN LIVER.** *(Ger.)* Schumacher, K. (Med. Clin., U. Cologne, Germany) and W. Schneider. *Verh Deutsch Ges Inn Med* 74:524-527, 1968.

2393 **THE IMMUNOLOGICAL BASIS OF CHRONIC LIVER DISEASES.** *(Ger.)* Rössler, R. (Med. Clin., U. Marburg/Lahn, Germany), K. Havemann and W. Dölle. *Verh Deutsch Ges Inn Med* 74:533-537, 1968.

2394 **STUDIES ON THE IMMUNOBIOLOGICAL SIGNIFICANCE OF SOLUBLE LIVER PROTEINS.** *(Ger.)* Meyer zum Büschenfelde, K. H. (2nd Med. Clin., Johannes Gutenberg U., Mainz, Germany) and F. K. Kössling. *Verh Deutsch Ges Inn Med* 74:529-533, 1968.

2395 ***IN VITRO* STUDIES OF LIPID METABOLISM IN THE NORMAL AND DISEASED HUMAN LIVER IN RELATION TO DIETARY FAT AND CARBOHYDRATE.** *(Ger.)* Phlippen, R. (Med. Clin., U. Cologne, Germany) and K. Oette. *Verh Deutsch Ges Inn Med* 74:239-241, 1968.

2396 **TEMPORARY HEPATIC INFLOW OCCLUSION IN DOGS TREATED WITH METHYLPREDNISOLONE AND ANTIBIOTICS.** *(E.)* Wimberly, J. E. (Vanderbilt U. Med. Sch., Nashville, Tenn.), C. E. Martin and J. H. Foster. *Amer Surg* 35(4):271-273, 1969.

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2398 **BENIGN RECURRENT INTRAHEPATIC CHOLESTASIS.** *(Ger.)* Rotthauwe, H. W. (Pediat. Clin., U. Bonn, Germany), W. D. Beseler and S. Kowalewski. *Klin Wschr* 47(3):140-149, 1969.

2399 **ACUTE PORPHYRIA AND GALACTORRHEA.** *(Sp.)* Reyes, H. (Salvador Hosp., U. Chile, Santiago). *Rev Med Chile* 96(6):422-426, 1968.

2400 **DIAGNOSIS OF A LARGE LIVER.** *(Fr.)* Dubrisay, J. *Hopital (Paris)* 57(795):11-22, 1969.

2401 **PORTAL THROMBOSIS AS A COMPLICATION OF SUPPURATING HEPATIC PEDICULITIS.** *(Fr.)* Paccalin, J., J. Périssat, P. Gratadour, D. Poisot, C. Béraud and F. J. Traissac. *Arch Franc Mal Appar Dig* 57(11):917-924, 1968.

2402 **EPITHELIAL NEOPLASMS OF THE LIVER IN CHILDREN.** *(Pol.)* Garska, W. (Munic. Hosp., Rzeszow, Poland), J. Rylski and Z. Sikora. *Pat Pol* 19(3/4): 493-497, 1968.

2403 **ECHINOCOCCOSIS CYSTICUS. REPORT OF THREE CASES.** *(Dan.)* Gutschik, E. (Bispebjerg Hosp., Denmark). *Ugeskr Laeg* 131(11):461-463, 1969.

2404 **THE OCCURRENCE OF ECHINOCOCCAL DISEASE IN DENMARK. A REVIEW AND EPIDEMIOLOGICAL INVESTIGATION.** *(Dan.)* Gutschik, E. (Bispebjerg Hosp., Denmark). *Ugeskr Laeg* 131(11):457-461, 1969.

2405 **LIVER ULTRASTRUCTURE IN TWO PATIENTS SUFFERING FROM HYDIOPATHIC HEMOCHROMATOSIS.** *(It.)* Casirola, G. (Dept. Med., U. Pavia, Italy) and P. Pontiggia. *Minerva Gastroent* 14(4):242-251, 1968.

2406 **DIAGNOSIS OF PRIMARY AND SECONDARY LIVER CARCINOMAS.** *(Ger.)* Klugmann, H. J. (Med. Polyclin. Inst., Karl Marx U., Leipzig, Germany). *Z Ges Inn Med* 23(21):672-674, 1968.

2407 **LIVER TRANSPLANTATION.** *(It.)* Grassi, G. (Santo Spirito Inst., Rome, Italy) and S. B. Valentini. *Chir Gastroent* 2(4):507-529, 1968.

2408 **HEPATIC CHANGES IN PORPHYRIA CUTANEA TARDA.** *(Sp.)* Manzino, B. E. (Fac. Med., Nat. U. La Plata, Argentina), J. E. Salvioli and R. P. Laguens. *Rev Esp Enferm Apar Dig* 28(1):7-14, 1969.

2409 **STUDIES OF THE KIDNEYS AND LIVER AFTER RENOPORTAL VENOUS ANASTOMOSIS IN DOGS.** *(Ger.)* Streicher, H. J. (Surg. Clin., U. Marburg/Lahn, Germany), H. Kuni, E. H. Graul, H. Domarus, E. L. G. zu Solms-Laubach. *Bruns Beitr Klin Chir* 216(7):659-664, 1968.

2410 **LEPTOSPIROSIS.** *(Fr.)* Nauciel, C. (Claude-Bernard Hosp., Paris, France). *Cah Coll Med Hop Paris* 10(1):3-8, 1969.

2411 **A CASE OF WILSON'S DISEASE.** *(Sp.)* Sicilia, J. J. (Nuestra Señora de la Concepcion Clin., Madrid, Spain), M. Aguirre, R. Santacruz and J. A. Torres. *Rev Clin Esp* 110(3):263-266, 1968.

2412 **A RARE CASE OF DISTURBANCE OF LIVER VEIN DEVELOPMENT INCLUDING A TURBULENT CLINICAL COURSE.** *(Rus.)* Shemiakin, O. S. and K. Ia. Kovaleva. *Klin Med* 49(11):102-105, 1968.

2413 **BENIGN RECURRENT CHOLESTATIC JAUNDICE IN PREGNANCY.** *(Sp.)* Marco, E. S. (La Paz Clin., Chile), M. G. Baron and M. Nistal. *Rev Esp En Enferm Apar Dig* 27(9):1313-1318, 1968.

2414 **TWO CASES OF PSEUDOOBSTRUCTIVE JAUNDICE IN PREGNANCY.** *(Sp.)* Cardus, J. C. (Soc. Secur. Health Clin., Barcelona, Spain), D. G. Sanchez J. T. Solano and E. P. Morales. *Rev Esp Enferm Apar Dig* 27(9):1319-1326, 1968.

See also 1823,1933,1940,1958,2000,2001,2008,2009,2010,2012,2014,2018,2019,2023,2029,2030,2034,2038,2040,2042, 2043,2045,2049,2050,2052,2056,2091,2097,2191,2236,2251

415 THE PROTECTIVE EFFECT OF L-ORNITHINE-L-ASPARTATE ON THE LIVER IN RATS WITH RUG-INDUCED LIVER DAMAGE. *(Ger.)* Zicha, K. District Public Hlth. System, Prague, Czechoslovakia) and . Zicha. *Z Gastroent* 6(6):423-429, 1968.

dult Wistar rats were given 1.3-1.6 ml of L-ornithine-L-asparate via the caudal vein on days 1 and 2 of the experiment. n days 4-8 this was combined with 0.2 ml of phenylbutazone .m. Another group of rats was given the same dose of L-ornithine-L-aspartate i.p. on days 1 and 3. On days 4-8 this was ombined with 0.2 ml of phenylbutazone i.m. A 3rd group of ats received only 0.2 ml of phenylbutazone i.m. for 5 days. wo of 10 rats in the 1st group died before the end of the xperiment. Histological studies showed swelling of liver tissue. There was cloudy cytoplasm in the hepatocytes which had oorly defined boundaries. Moderate hyperemia, a few small oci of necrosis, cellular infiltrates, and small droplets of fat n the endothelium were also present. All animals in the 2nd roup survived. Liver changes were similar to those described bove but not as pronounced. Before the end of the experiment 8 of the 10 animals receiving phenylbutazone alone died. Liver tissue was swollen and necrosis was seen inside the acini. epatocytes and the endothelium contained large amounts of at deposits which passed over into adjacent acini.

2416 ROLE OF UPTAKE AND OXIDATION OF PLASMA FREE FATTY ACIDS BY THE IVER IN THE DEVELOPMENT OF THE ETHANOL-INDUCED FATTY LIVER. *(E.)* Fex, G. (Dept. Chem., U. mea, Sweden) and T. Olivecrona. *Acta Physiol Scand* 75(1/2): 8-81, 1969.

Groups of fasted female rats were tube-fed ethanol (6 g/kg), n isocaloric amount of glucose, or nothing. Half the rats in ach group were given hourly s.c. injections of nicotinic acid, nd 6 hr after the feeding, 9,10-^{3}H-oleic acid complexed to erum albumin was injected intravenously; 5 min later the rats ere killed and the concentrations of plasma free fatty acids nd liver glycerides and labeling of liver and carcass lipids were etermined. Plasma free fatty acid concentrations were similar n the ethanol-fed and fasted rats but lower in the glucose-fed ats. Liver glyceride concentrations were elevated in the ethanol-fed rats. In all groups, nicotinic acid lowered both the liver glyceride concentration and the plasma free fatty acid levels. Total liver radioactivity was highest in the ethanol-fed rats, intermediary in the glucose fed rats, and lowest in the fasted rats. The liver radioactivity was not significantly changed by nicotinic acid. It is suggested that these differences in liver radioactivity reflect differences in the oxidation of plasma free fatty acids taken up the liver and that a major cause of the ethanol-induced fatty liver is a decreased hepatic oxidation of plasma free fatty acids taken up at a normal rate.

2417 THE EFFECT OF PROPYL GALLATE ON HEPATIC STEATOSIS PRODUCED BY CARBON TETRACHLORIDE. *(It.)* Ugazio, G. (Inst. Gen. Path., U. Turin, Italy) and M. V. Torrielli. *Boll Soc Ital Biol Sper* 44(14): 1166-1170, 1968.

Male Wistar rats were given 250 μliters CCl_4/100 g body weight dissolved in mineral oil and instilled through a stomach tube. By the same route some rats were given 30 mg/100 g body weight of propyl gallate 45-60 min before administration of CCl_4. Others received 20 mg/100 g body weight of propyl gallate p.o. 3 and 7 hr after CCl_4. Increases in liver triglycerides produced by CCl_4 were completely prevented by pretreatment with propyl gallate. When this antioxidant was administered after the CCl_4, the percentage of protection decreased.

2418 EFFECT OF ULTRASOUND ON THE ACID AND ALKALINE PHOSPHATASE ACTIVITY IN THE SERUM AND LIVERS OF RATS. *(Pol.)* Niewiarowska-Pawlus, A. (Inst. Physiol. Chem., Polish Acad. Med., Szczecin, Poland), J. Goertz and P. Slawinski. *Pat Pol* 19(3/4):517-524, 1968.

Exposure of adult male albino rats to ultrasound (800 kilocycles/sec at an intensity of 1 watt/cm^2, applied over the liver) for an initial period of 5 min, followed by daily exposures of 1 min each for 1-4 days, was followed by a sharp drop in serum alkaline phosphatase and eventually by a significant decrease in serum acid phosphatase, accompanied by the appearance of an increased number of lysosomes in the hepatocytes and the cytoplasm of the Kupffer cells. The serum alkaline phosphatase decreased from 26.39 K.A. units in controls to 21.83 U after only one exposure (21.34 U after 5 exposures). The serum acid phosphatase decreased from 15.75 K.A. units in controls to 15.06 U after 1 exposure, 14.26 U after 3 exposures, and 13.89 U after 5 exposures.

2419 ULTRASTRUCTURAL CHANGES PRODUCED IN THE NORMAL AND REGENERATING RAT LIVER CELL BY LEPINAL (PHENETHYLBARBITURIC ACID). *(Ger.)* Bader, G. (Distr. Hosp., Rostock-Südstadt, Germany). *Acta Hepatosplen* 15(6):400-408, 1968.

In male Wistar rats, administration of Lepinal (phenylethylbarbituric acid) at a dosage of 100 mg/kg/day for 14 days i.p. was occasionally lethal but generally produced a deep sleep lasting about half a day. After 14 days, 20 of 30 surviving animals and 34 untreated controls were subjected to partial hepatectomy (with a mortality rate of 10% and 5%, resp.), after which the Lepinal-treated animals were given the barbiturate in the drinking water (150 mg/kg/day) until sacrifice up to 9 days later. Electron microscopy of samples of liver tissue obtained from animals sacrificed at regular intervals during the first few days after partial hepatectomy revealed proliferation of the smooth endoplasmic reticulum and an increase in free ribosomes associated with increased disorganization and dissociation of the endoplasmic reticulum and an increased number of peribiliary bodies. Regeneration after partial hepatectomy was slower in rats receiving Lepinal, but was still orderly, probably because RNA metabolism is the least affected by the barbiturate. It is concluded that the pathological regeneration of the liver cell, in the precancerous stage, is probably a problem of alterations in the energy balance.

2420 ULTRASTRUCTURAL CHANGES IN THE RAT LIVER UNDER THE INFLUENCE OF SOME CHOLERETIC DRUGS. *(Ger.)* Hegewald, G. (Inst. Path., Ernst-Moritz-Arndt U., Greifswald, Germany), G. Barenwald,

K. U. Möritz and A. Grisk. *Acta Hepatosplen* 15(6):382-388, 1968.

Since choleretic agents are generally used in the presence of disturbances in hepatic function, it is commonly assumed that their side effects to the liver parenchyma must be minimal. This has been shown to be true for sodium dehydrocholate (100 mg/kg/day i.p.), which produced only an increase in lysosomes after 14 days. Experiments with Wistar rats are reported, however, which showed significant ultrastructural changes in the liver 30 min and 24 hr after single i.p. doses (100 mg/kg of p-hydroxphenylsalicylamide, mono-α-(2,5-endomethylene-Δ^3-cyclohexenyl) ethylsuccinate or 1-phenylpropanol, as well as after daily administration of the same doses of these same choleretic agents for 14 days. In the case of these agents, but not in the case of sodium dehydrocholate, the increase in hepatic function was associated with characteristic signs of damage to the hepatic fine structure, including changes in the endoplasmic reticulum and transformation of the mitochondria. Administration of only the solvent (1,2-propyleneglycol) produced no such changes in controls. It is concluded that these 3 choleretic drugs are potentially hepatotoxic.

2421 **EFFECT OF URIDINE DIPHOSPHOGLUCOSE ON THE BILIRUBIN CLEARANCE IN NORMAL SUBJECTS AND PATIENTS WITH HEPATIC DISEASE.** *(It.)* De Bac, C. (S. Spirito Charit. Inst., Rome, Italy), T. Altieri, G. Beni, G. Minutolo and D. Summonti. *Gazz Med Ital* 127(11): 443-445, 1968.

In studies on 8 normal subjects and 8 patients with chronic hepatitis, administration of uridine diphosphoglucose (UDPG) was found to accelerate the hepatic clearance of bovine bilirubin (4 mg/kg i.v. in 5 min). In 4 of the controls and 2 hepatitis patients, UDPG was administered once at a dose of 100 mg i.v. 30 min before administration of bilirubin, and the bilirubin clearance curves were compared with those in 4 controls and 2 hepatitis patients not given UDPG. In 2 other hepatitis patients, bilirubin clearance was studied both with and without prior UDPG (single doses), while in the remaining 2 hepatitis patients the bilirubin clearance was studied before and after administration of 40 mg/day i.m. for 7 days. In all cases, but especially in the healthy subjects, prior administration of UDPG markedly lowered the serum bilirubin levels. The stimulatory effect of UDPG seems to be a transitory phenomenon, since its daily administration for 7 days had the least effect. This effect is ascribed both to stimulation of glucuronic acid conjugation by the liver and to a membrane phenomenon favoring extraction of the pigment from the blood stream.

2422 **CARCINOGENIC ACTION OF ELAIOMYCIN IN RATS.** *(E.)* Schoental, R. (Toxicol. Res. U., MRC Labs., Carshalton, England). *Nature* 221(5182):765-766, 1969.

2423 **A BIOLOGICAL, CLINICAL AND HISTOLOGICAL STUDY OF TEN PATIENTS WITH ALCOHOLIC HEPATITIS SUBJECTED TO A THERMAL TREATMENT AT VICHY.** *(Fr.)* Bonnet, G. F. (15 Rue Nicolas Larbaud, Vichy, France). *Rev Int Hepat* 18(8):947-966, 1968.

2424 **ULTRASTRUCTURAL ASPECTS OF THE LIVER IN LEAD INTOXICATION.** *(Fr.)* Banciu, T. (Timisoara Med. Inst., Romania) and A. Petrovici. *Acta Gastroe Belg* 31(10):693-699, 1968.

2425 **THIOCTIC ACID PROTECTION OF ISOLATED PERFUSED RAT LIVER AGAINST THE POTASSIUM RELEASING ACTION OF PHALLOIDIN.** *(Ger.)* Frimmer, M. (Fac. Vet. Med., Justus Liebig U., Giessen, Germany), G. Waldvogel and G. Weil. *Klin Wschr* 46(23):1288-1289, 1968.

2426 **HANOT AND KIENER'S DISEASE, DIFFUSE MESENCHYMATOUS HEPATITIS WITH NODULAR LYMPHOMATOSIS: A HISTOLOGICAL AND CYTOLOGICAL STUDY IN THREE DIMENSIONS.** *(Fr.)* Albot, G. (Gastroent. Ctr., Hotel Dieu, Paris, France), J. Diébold, J. P. Camilleri and P. Delavierre. *Sem Hop Paris* 43(3):145-159, 196

2427 **THE EFFECT OF ETHANOL AND CYANIDE ON $NAD/NADH_2$ RATIOS IN RAT LIVER.** *(E.)* Baxter, R. C. (Dept. Biochem., U. Sydney, Australia) and W. J. Hensley. *Biochem Pharmacol* 18(1):233-236, 1969.

2428 **STUDIES ON POISONING BY *MACROZAMIA COMMUNIS.* I. BIOCHEMICAL DISTURBANCES IN THE LIVER.** *(E.)* Healy, P. J. (Dept. Vet. Path., U. Sydney, Australia). *Biochem Pharmacol* 18(1):85-92, 1969.

2429 **STUDIES ON POISONING BY *MACROZAMIA COMMUNIS.* II. EFFECTS OF MODIFYING AGENTS UPON CHANGES INDUCED IN THE LIVER BY *MACROZAMIA COMMUNIS.*** *(E.)* Healy, P. J. (Dept. Vet. Path., U. Sidney, Australia). *Biochem Pharmacol* 18(1):93-99, 1969.

2430 **TOPICS IN CLINICAL MEDICINE: THE LIVER AND ORAL CONTRACEPTIVES.** *(E.)* Hartley, R. A. (Johns Hopkins Hosp., Baltimore, Md.), J. K. Boitnott and F. L. Iber. *Johns Hopkins Med J* 124(2):112-118, 1969.

2431 **REDUCED SERUM VERY LOW-DENSITY LIPOPROTEIN LEVELS AFTER ACUTE ETHANOL ADMINISTRATION.** *(E.)* Madsen, N. P. (Dept. Path., U. Melbourne, Victoria, Australia). *Biochem Pharmacol* 18(1):261-262, 1969.

2432 **EXCHANGE BLOOD TRANSFUSION IN HEPATIC COMA OF ACUTE HEPATIC NECROSIS.** *(E.)* Wewalka, F. (I. U. Med. Clin., Vienna, Austria). *Digestion* 1(5):311-314, 1968.

2433 **METRONIDAZOLE IN AMEBIC HEPATITIS AND LIVER ABSCESS.** *(E.)* Venkateswara Rao, S. (Osmania Med. Coll., Hyderabad, India), D. Satyanarayana and K. Jayapal Reddy. *J Indian Med Ass* 51(9):450-452, 1968.

2434 **INTERFERENCE OF *CYSTICERCUS FASCIOLARIS* IN THE FORMATION OF HEPATIC LESIONS IN RATS, INDUCED BY p-DIMETHYLAMINOAZOBENZENE (DAB).** *(E.)* Altman, R. F. A. (Inst. Oswaldo Cruz, Rio de Janeiro, Brazil). *Arch Geschwulstforsch* 33(2):113-118, 1969.

2435 VENTRICULAR FUNCTION IN NONCARDIACS WITH ALCOHOLIC FATTY LIVER: ROLE OF ETHANOL IN THE PRODUCTION OF CARDIOMYOPATHY. *(E.)* Regan, R. J. (New Jersey Coll. Med., Jersey City), G. E. Levinson, H. A. Oldewurtel, M. J. Frank, A. B. Weisse and C. B. Moschos. *J Clin Invest* 48(2):397-407, 1969.

2436 THE EFFECTS OF FEEDING TOXIC GROUNDNUT MEAL TO GROWING PIGS AND ITS INTERACTION WITH HIGH-COPPER DIETS. *(E.)* Barber, R. S. (Natl. Inst. Res. Dairying, Reading, England), R. Braude, K. G. Mitchell, J. D. J. Harding, G. Lewis and R. M. Loosmore. *Brit J Nutr* 22(4):535-554, 1968.

2437 HEPATITIS AND APLASTIC ANEMIA. [CASE REPORT] *(E.)* Perlmutter, R. A. (Parkwood Community Hosp., Canoga Park, Calif.). *Calif Med* 110(2): 135-138, 1969.

2438 RECURRENT HEPATITIS ATTRIBUTABLE TO HALOTHANE SENSITIZATION IN AN ANESTHETIST. [CASE REPORT] *(E.)* Klatskin, G. (Yale U. Sch. Med., New Haven, Conn.) and D. V. Kimberg. *New Eng J Med* 280(10):515-522, 1969.

2439 THE EFFECT OF AZATHIOPRINE ON THREE PATIENTS WITH ALL THE SYMPTOMS OF LUPOID HEPATITIS. *(Ger.)* Heuckenkamp, P. U. (Med. Polyclin., U. Munich, Germany) and N. Zöllner. *Verh Deutsch Ges Inn Med* 74:897-901, 1968.

2440 IMMUNOLOGICAL DISORDERS IN CHRONIC HEPATITIS. *(Ger.)* Scheiffarth, F. (U. Hosp., Erlangen, Germany). *Verh Deutsch Ges Inn Med* 74:778-783, 1968.

2441 THE DIAGNOSIS AND TREATMENT OF HEPATITIS WITH AUTOIMMUNE FEATURES. *(Ger.)* Schneider, W. (German Red Cross Blood Distribution Service, Rotenburg, Germany). *Verh Deutsch Ges Inn Med* 74:537-539, 1968.

2442 TREATMENT OF AMEBIC ABSCESS OF THE LIVER. *(E.)* Spellberg, M. A. (Michael Reese Hosp., Chicago, Ill.). *Amer J Gastroent* 51(4):298-302, 1969.

2443 EFFECT OF AN EXTRACT OF UV-IRRADIATED LINOLENIC ACID ON AZO DYE CARCINOGENESIS. *(E.)* Mulay, A. S. (Natl. Cancer Inst., Bethesda, Md.), R. W. O'Gara, H. J. Anderson, L. D. Saslaw and V. S. Waravdekar. *Cancer Res* 29(2):373-379, 1969.

2444 LIVER DAMAGE FOLLOWING THE ADMINISTRATION OF SULPHATRIAD. *(E.)* Mooney, R. A. H. (Meath Hosp., Dublin, Ireland). *J Irish Med Ass* 62(379):25-26, 1969.

2445 EMERGENCY RIGHT HEPATIC LOBECTOMY FOR RUPTURE DUE TO BLUNT INJURY. *(E.)* Pearlman, D. M. (Lincoln Hosp., Bronx, N. Y.) and S. Grayer. *Amer J Surg* 117(3):421-423, 1969.

2446 CARCINOGENIC ACTIVITY OF 3,3'-DICHLORO-4,4'-DIAMINODIPHENYLMETHANE IN RATS. *(Ger.)* Steinhoff, D. (Inst. Exp. Path., Bayer Dye Works, Wuppertal-Elberfeld, Germany). *Naturwissenschaften* 56(4): 215-216, 1969.

2447 REPORT OF A CASE OF RIGHT HEAPTIC LOBECTOMY BY THE METHOD OF TON THAT TUNG FOLLOWING TRAUMATIC RUPTURE OF THE LIVER. *(Gr.)* Filippakis, M., P. Alivizatos and I. Katoubas. *Acta Chir Hellen* 95(5):750-755, 1968.

2448 THE POSSIBILITY OF USING STEROID HORMONES IN EXPERIMENTAL AND CLINICAL INTOXICATION WITH CARBON TETRACHLORIDE. *(Rus.)* Gorodetskii, M. M. *Gig Tr Prof Zabol* 12(12):32-33, 1968.

2449 CHRONIC INTOXICATION WITH TETRABROMOETHANE AND METHYLENE BROMIDE. (CLINICAL OBSERVATIONS). *(Rus.)* Danilin, V. A., A. K. Voronin, and P. S. Grigor'iev. *Gig Tr Prof Zabol* 12(12):39-40, 1968.

2450 LIVER ABSCESSES: DISCUSSION OF ONE CLINICAL CASE. *(Fl.)* Louis, H. (Clin. Intern. Med., State U., Ghent, Belgium) and L. Demeulenaere. *T Gastroent* 11(6):574-577, 1968.

2451 THE EFFECT OF NITROGEN MONOXIDE AND CYCLOPROPANE ON THE LIVER. *(Rus.)* Zhdanov, G. G. (Kalinin Med. Inst., USSR), V. Ya. Danilyak and A. M. Lepeshkina. *Farmacol Toksik* 32(1):88-90, 1969.

See also 1921,1922,1924,1934,1937,1943,1955,2004,2494

2452 **THE ETIOLOGY OF POSTHEPATITIC HYPERBILIRUBINEMIA BASED ON AN INVESTIGATION OF BILIRUBIN TRANSFER.** *(Ger.)* Bettge, S. (Med. Clin., Justus Liebig U., Giessen, Germany) and G. Hornung. *Klin Wschr* 47(3):149-154, 1969.

Direct and indirect bilirubin determinations were made on venous blood from 4 groups of subjects 9, 13, 17, 21, and 25 min after 50 mg of bilirubin had been given i.v. Subjects included 7 normal controls, 7 with or convalescing from acute hepatitis, 5 with congenital hemolytic jaundice, and 13 with hyperbilirubinemia and no symptoms of liver disease. From this data the bilirubin half-life, excretion constant, and transfer value were calculated. The bilirubin half-life was increased and transfer values were almost normal in acute hepatitis. During convalescence the half-life approached normal values and the transfer value increased. Some patients with congenital hemolytic jaundice had normal half-life values and others had increased values; transfer values were significantly increased. Changes were not consistent in 11 of the 13 patients with hyperbilirubinemia who had histories of viral hepatitis. Some had normal half-life values and significantly increased bilirubin transfer while others had long half-lives and normal transfer values. No evidence of intravascular hemolysis was found in those patients with elevated transfer values. All had normal liver function tests, but bilirubin values ranged from 1.5-4.3 mg%. Only indirect bilirubin levels were increased. None had a history of congenital jaundice although some had histories of jaundice dating back to childhood. Increased bilirubin transfer in these patients appears to be caused by shunt hyperbilirubinemia.

2453 **RELATIONS BETWEEN HAPTOGLOBIN AND SERUM BILIRUBIN IN ACUTE INFECTIOUS HEPATITIS IN CHILDREN.** *(Ger.)* Zöllner, H. (Pediat. Clin., U. Greifswald, Germany), H. Reddemann and R. Giebelmann. *Deutsch Med Wschr* 94(6):270-273, 1968.

Determinations were made of serum bilirubin and haptoglobin in 33 children (20 males and 13 females, aged 2-13 yr) with acute infectious hepatitis on admission, 14 days later, on discharge, and 1 month later. Analysis of the results with Student's t-test showed a significant increase in serum haptoglobins and α_2- and β-globulins 14 days after the onset of symptoms. At the same time there was an inverse relation between serum bilirubin and haptoglobin concentrations. This suggests that in children a hemolytic stage, in which haptoglobins are consumed and bilirubin levels increase, precedes increased haptoglobin synthesis resulting from damage to the liver parenchyma. In adults hemolysis is more evident than haptoglobin synthesis.

2454 **A CLINICAL AND STATISTICAL STUDY OF THE COURSE OF VIRAL HEPATITIS IN 272 SUBJECTS FOLLOWED FROM THE ACUTE STAGE OF THE DISEASE AND IN 150 SUBJECTS EXAMINED 1-5 YEARS AFTER AN ACUTE EPISODE OF HEPATITIS.** *(It.)* De Ritis, F. (Clin. Infect. Dis., U. Naples, Italy), G. Giusti, M. Piazza, F. Piccinino, G. Da Villa and G. Manzillo. *Minerva Med* 60(5): 113-127, 1969.

On the basis of clinical symptoms, liver function tests, bilirubin levels, SGOT and SGPT activities and serum protein values, 272 patients (172 males and 100 females, 101 of whom were less than 10 yr old) were divided into 4 groups. They included 1) 166 (61.03%) discharged as completely recovered, 2) 15 (5.51%) discharged with signs of persistent infection, 3) 3 (1.1%) who died, and 4) 88 (32.36%) discharged against the advice of the doctor. A follow-up of 55 patients in group (4) showed that 38 had completely recovered within 60 days and 17 still had signs of liver involvement. There was a statistically significant correlation between the age of the patients and the duration of the acute stage of the disease but no correlation between the sex of the patient and the duration of the acute stage or between the outcome of the acute stage and the age and sex of the patients. All 3 patients who developed hepatic comas after admission died. Follow-ups made 1-5 yr after episodes of viral hepatitis on 150 patients discharged as completely recovered showed that 109 (72.67%) had completely recovered, 22 (14.67%) still had signs of active disease, and 19 (12.66%) had some abnormalities in laboratory tests which require a longer study. No correlations were established between hepatosplenomegaly, age, or sex and the results of laboratory tests. There was, however, a significant correlation between the outcome of the acute stage and the persistence of abnormalities in laboratory tests.

2455 **THE SEQUELAE OF VIRAL HEPATITIS AND FACTORS LEADING TO THE DEVELOPMENT OF CHRONIC HEPATITIS. A CLINICAL AND EPIDEMIOLOGICAL STUDY.** *(Rum.)* Pecurariu, O. (Hosp. Adults No. 1, Brasov, Romania), R. Albuleţ, E. Bălan, C. Berbescu, J. Bozianu, M. Burcin, S. Creţulescu, M. Davidovici , A. Dumitrescu, L. Enciulescu, R. Greif, V. Grigoriu, M. Hilmu, H. Kernbach, O. Mereţ, E. Purdilă, O. Schmidt, B. Székely and C. Zoltner. *Med Intern (Bucur)* 20(5):557-562, 1968.

A follow-up was made of 364 patients with viral hepatitis. Infectious hepatitis had been diagnosed in 50.2%, serum hepatitis in 36.5%, and the route of infection could not be established in 13.5%. Chronic hepatitis developed in 13.5% and cirrhosis in 1.5% of those with serum hepatitis. Chronic hepatitis was seen in 8.7% of those with infectious hepatitis, and none of the patients in this group developed cirrhosis. In about 16% the first symptoms of chronic hepatitis appeared 1-5 yr after acute viral infection. More than 57% of the patients with chronic hepatitis had had severe viral hepatitis and only 9.7% had had mild or moderately severe forms. Other factors favoring the development of chronic hepatitis were a preicteric stage lasting more than 2 weeks, insufficient rest, an unsuitable diet, alcoholism, and a history of gallbladder disease. A retrospectiv study of another group of 50 patients (42 with chronic hepatitis and 8 with cirrhosis) showed that 34 had histories of viral hepatitis and only 5 had only histories of alcoholism. The cause of liver disease could not be established in 10 cases, and 1 patient had a history of cholelithiasis and hypersplenism.

2456 **CRITICAL ANALYSIS OF "HYPERGLOBULINEMIC" CHRONIC HEPATITIS.** *(Rum.)* Fodor O. (Inst. Med. Pharm., Cluj, Romania), G. Nicoara, N. Parau and E. Barbarino. *Med Intern (Bucur)* 20(6):665-677, 1968.

Of 120 patients (82 males and 38 females) with chronic hepatitis, 98 had histories of acute viral hepatitis, 18 may have had asymptomatic forms, and infection was ruled out in 4 cases. Only 3 patients were under 30 yr old. Hypersplenism was found in 22 cases. In some cases hepatitis was associated with autoimmune diseases. Hypergammaglobulinemia was present in 98 cases (85%) and hyperbetaglobulinemia in 84 (70%). The IgG fraction was moderately to greatly increased in 94%, the IgM fraction in 83%, and the IgA fraction in 51%. A large percentage of these patients had anti-liver and nonspecific factors (antigammaglobulin, antithyroglobulin, anti-DNA and anti-RNA) in their serum together with cryoproteins. None of the patients tested had anti leukocyte factors of LE cells.

2457 **ULTRASTRUCTURAL CHANGES IN THE LIVER AFTER EXPERIMENTAL INFECTION WITH THE GROUP C ARBOVIRUS Be 17 (ORIBOCA): PRELIMINARY COMMUNICATION.** *(Por.)* De Lacerda, P. R. S. (Fac. Med. Sci., State U., Guanabara, Rio de Janeiro, Brazil). *Hospital (Rio)* 74(3):815-830, 1968.

Electron micrographs were prepared of liver tissue taken from 11-day-old Wistar rats sacrificed 50 days after i.p. or intracerebral inoculation with the Oriboca Be 17 strain of arbovirus. Liver tissue was fixed in glutaraldehyde within 90 sec after death, and moribund animals were sacrificed by decapitation. The livers of such animals showed diffuse or focal hydropic degeneration and tumescence of the hepatocytes, moderately severe vacuolar degeneration, moderate necrosis, mild hyperemia of the sinusoids, and microcellular infiltration of the portal tracts. The electron microscope revealed virus-like particles in both the nucleus and the cytoplasm, accompanied by increases in the number of osmiophilic mitochondrial granules, nuclear and nucleolar chromatin, and the number of free ribosomes in the cytoplasm, as well as the presence of cytoplasmic pseudoinclusion bodies probably consisting of accumulations of ribosomes in the dilated endoplasmic reticulum. The cellular reaction varied from hyperplasia to frank necrosis, but fatty infiltration was a consistent finding. Degenerative changes leading to necrosis were also seen in the Kupffer cells.

2458 **VIRAL HEPATITIS AND DAMAGE TO THE FETUS: HISTOLOGICAL CHANGES SEEN IN HUMAN EMBRYOS WHOSE MOTHERS DEVELOPED VIRAL HEPATITIS DURING PREGNANCY.** *(Ger.)* Ermert, A. (Inst. Anat., U. Zurich, Switzerland). *Z Kinderheilk* 105(1): 1-32, 1969.

Detailed histopathological studies were carried out on 5 fetuses taken by therapeutic abortion (71, 74, 75 and 88 days post-menstruation and 56 days post-conception, resp.) because their mothers had viral hepatitis (present at the beginning of pregnancy in 2 cases and acquired during the 1st 2-6 weeks in the others). One specimen (taken 71 days post-menstruation), however, was fixed after too long a delay, so that considerable autolysis had taken place. The principal finding in the 4 other fetuses was destruction of the blood-vessel endothelium (umbilical vein, aorta, carotid arteries, superior vena cava) and of the endocardium. Necrotic material was apparently transported from these sites into the brain, kidneys, and intestinal tract, resulting in histological alterations in the brain, spinal cord, musculature and lungs. The nucleus of the crystalline lens was uniformly destroyed, and multinucleated giant cells were seen in the liver, heart, lungs, thymus, kidney and brain of all 4 fetuses, especially near the necrotic areas. Other organs were normal. The mechanism of the hemorrhagic diathesis and other fetal abnormalities produced by hepatitis virus is discussed and compared with the effects of rubeola and other virus diseases.

2459 **LIVER RHEOGRAPHY IN NORMAL CHILDREN AND PATIENTS WITH INFECTIOUS HEPATITIS.** *(Rus.)* Sokol, A. N. (Chernovtsy Med. Inst., USSR). *Vop Okhr Materin Dets* 13(12):37-42, 1968.

Liver circulation was studied by rheography in 18 normal controls, aged 4-16 yr, and in 81 children with infectious hepatitis. Rheographic examinations were made on 81 at admission, on 58 during regression of jaundice, and on 73 before discharge. In most cases there was little or no difference between the rheograms of hepatitis patients on admission and those of controls. However, on admission all but 13 patients had abnormally low rheographic indices, I (amplitude A/amplitude of the calibrated signal E) and amplitude-frequency indices (I/R-R). The only significant age differences were between younger and older children of school age. These parameters increased during the regression of jaundice. This is attributed to improvements in systemic and local circulation and the lack of physical strain on the cardiovascular system during complete bed rest. These indices decreased again during convalescence.

2460 **INCREASED PROTEIN SYNTHESIS IN LIVER BIOPSY SPECIMENS FROM PATIENTS WITH ACUTE HEPATITIS.** *(Ger.)* Richter, E. (Med. Clin., Justus-Liebig U., Giessen, Germany), S. Clauditz, B. Leinweber and H. A. Kühn. *Acta Hepatosplen* 15(6):376-381, 1968.

Biochemical studies on liver needle biopsy specimens obtained from 13 patients with acute viral hepatitis, 20 with histologically confirmed chronic active hepatitis, 17 with histologically confirmed cirrhosis, and 6 healthy controls revealed increased incorporation of ^{14}C-glycine and aspartic acid into protein in all patients. The rate of protein synthesis was 6-7 times as high as in controls in patients in the active phase of viral hepatitis, decreasing significantly as the acute phase began to recede. The increase was also less marked in patients with chronic hepatitis or cirrhosis. Specimens from patients with acute viral hepatitis also showed increased incorporation of the labeled amino acids into nucleic acids, as well as of 2-^{14}C-acetate into cholesterol and of 7-^{14}C-nicotinic acid into nicotinamide adenine dinucleotide. It is concluded that liver disease *per se* results in a nonspecific stimulation of metabolic processes in the liver.

2461 **DETERMINATION OF TRANSAMINASE IN THE PROPHYLAXIS OF VIRAL HEPATITIS.** *(It.)* Castiglione, L. (Dept. Health, Pescara, Italy) and A. Garrani. *Med Soc* 18(8):320-322, 1968.

2462 **EPIDEMIOLOGICAL DATA ON VIRAL HEPATITIS IN THE PROVINCE OF PESCARA FROM 1957 TO 1966.** *(It.)* Franco, P. (Via Ravenna 3, Pescara, Italy). *Med Soc* 18(8):316-320, 1968.

2463 EPIDEMIOLOGICAL STUDIES IN HEPATITIS AS A ROUTINE PROCEDURE IN LIVER DISPENSARIES. *(Ger.)* Kleine, F. D. (Med. Acad., Magdeburg, Germany). *Z Aerztl Fortbild (Jena)* 62(22):1237-1240, 1968.

2464 EPIDEMIOLOGY AND PROPHYLAXIS OF VIRAL HEPATITIS. *(Sp.)* Katz Ugarte, R. (Fac. Med., Santiago, Chile). *Arq Gastroent* 6(1):21-32, 1969.

2465 VIRAL HEPATITIS IN PERSONS WITH PULMONARY TUBERCULOSIS. *(It.)* Arcuri, F. (Munic. Hosp., Genoa, Italy), N. Piersantelli and F. Rizzo. *Arch Maragliano Pat Clin* 24(6):699-707, 1968.

2466 INFECTIOUS HEPATITIS WITH MYELITIS AND NEURITIS. [CASE REPORT] *(E.)* Brahmaji Rao, U. (Andhra Med. Coll., Visakhapatnam, India), M. L. Suri and S. Gupta. *J Indian Med Ass* 51(9):460-463, 1968.

2467 VIRUS HEPATITIS AFTER BLOOD TRANSFUSION. *(E.)* Zuckerman, A. J. (London Sch. Hyg. Trop. Med., England). *Brit J Clin Pract* 23(1):9-10, 1969.

2468 USE OF PLASMA AND OTHER PROTEIN PREPARATIONS IN ACUTE HEPATITIS. *(Rus.)* Starosel'skii, D. V. (Crimean Med. Inst., Simferopol, USSR) and N. Ia. Riazanova. *Klin Med (Moskva)* 47(2):119-123, 1969.

2469 VIRAL HEPATITIS AND PREGNANCY. *(E.)* Di Nola, F. (Amedeo di Savoia Infec. Dis. Hosp., Turin, Italy), G. Bracco, A. Pasquale and P. Moiraghi. *Panminerva Med* 10(12):531-535, 1968.

2470 **THE PLACE OF SOME RECENTLY DEVELOPED DIURETICS IN THE TREATMENT OF DECOMPENSATED HEPATIC CIRRHOSIS.** *(Fr.)* Platteborse, R. (Saint Gilles Hosp., Belgium), W. Page and G. van Braekel. *Acta Gastroent Belg* 31(10):621-652, 1968.

Sodium balances were run on 9 alcoholics with decompensated cirrhosis during treatment with diuretics and a low-sodium diet. At first, triamterene was used alone and then in combination with different doses of epitizide. Finally, triamterene was replaced by spironolactone. Diuretics were administered at 8 a.m. and 5 p.m. with the largest dose being given in the morning. Therapy was generally given 3 days out of 6. Triamterene increased urinary Na excretion, particularly in patients who excreted less than 10 mEq Na/24 hr before diuretic therapy. K excretion remained unchanged or decreased, and the volume of urine excreted did not change appreciably. A combination of epitizide and triamterene increased urinary Na excretion in all patients, but became increasingly less effective. This resistance to therapy depended on the severity of hepatic decompensation and the extent of secondary hyperaldosteronism before treatment. K excretion varied and decreased with increasing Na excretion. The doses of spironolactone were not large enough and therapy was not continued long enough to draw any valid conclusions about its effects. Increases in blood urea concentrations generally occurred toward the end of therapy. In 1 case increased urea concentrations were caused by a gastrointestinal hemorrhage. During diuretic therapy plasma Na levels increased to normal in 2 of 9 cases, plasma chloride values tended to decrease, and plasma K levels and alkaline reserves remained about the same.

2471 **THE VALUE OF CERVICAL LYMPHOVENOUS ANASTOMOSIS IN THE TREATMENT OF PORTAL HYPERTENSION IN HEPATIC CIRRHOSIS.** *(Ger.)* Koch, W. (Marien Hosp., Hamburg, Germany). *Med Welt* 20(8):394-397, 1969.

In 12 cirrhotic patients the thoracic lymph duct was traced to a single trunk in the cervical region and an end-to-side anastomosis was made between it and the jugular vein. In almost all cases the central venous pressure increased after surgery, reaching a maximum 5-6 hr later. It is recommended that a catheter be placed in the vena cava so that the blood volume can be reduced if necessary by phlebotomy. In all cases ascites disappeared or responded to medication, esophageal varices regressed, and acute bleeding could be controlled more readily by conservative methods. Portacaval shunts are still the method of choice in treating portal hypertension, but cervical lymphovenous anastomoses are valuable in the treatment of elderly patients with bleeding varices, of recurrent variceal bleeding in decompensated cirrhosis, of acute bleeding varices as a stopgap measure before a portacaval anastomosis can be made, and of ascites which does not respond to other treatment.

2472 **STUDIES OF FAT ABSORPTION IN PATIENTS WITH HEPATIC CIRRHOSIS.** *(Ger.)* Eisenburg, J. (1st Med. Clin., U. Munich, Germany), P. Schwandt, A. Christoforis, K. H. Koczorek, M. M. Forell, P. Kiefhaber and K. W. Frey. *Fortschr Med (Munich)* 87(5):185-188, 1969.

The ^{131}I-triolein test was run on 17 subjects (10 men and 7 women, aged 30-68 yr) with and without administration of 2 tablets of Combizym compound (120 mg *Aspergillus oryzae* enzyme concentrate, 400 mg pancreatin, and 60 mg dried, purified ox-gall). These subjects included 6 with no diseases of the liver or pancreas and 11 with confirmed cirrhosis. The cirrhotics included 7 with a history of alcoholism and 5 with a history of hepatitis. Serum lipids were within normal limits and serum bilirubin values were normal or slightly elevated in the cirrhotics. Pancreatic function tests showed that the majority had increased secretion of pancreatic juice and bicarbonate. Three cirrhotics, who secreted normal quantities of pancreatic juice and bicarbonate, secreted abnormally small amounts of pancreatic enzymes. There was no significant difference between fat absorption in cirrhotics without pancreatic insufficiency and in controls. In these subjects, administration of Combizym had little effect on fat absorption. Fat absorption was lower in cirrhotics with pancreatic insufficiency but was increased by administration of Combizym.

2473 **COLOR AND LIGHT SENSE IN LAENNEC'S CIRRHOSIS.** *(It.)* Meduri, R. (Ophthalmol. Clin., U. Bologna, Italy), G. Frasca and P. Anselmi. *Fegato* 14(4):493-514, 1968.

Ophthalmologic examinations were made on 41 patients (27 males and 14 females, aged 33-67 yr) with advanced Laennec's cirrhosis and ascites. Patients with changes in the refracting medium and eyeground were excluded. In 8 patients, 6 males and 2 females, severe, poorly defined, non-hereditary forms of color blindness were found associated with definite increases in the adaptometric threshold. In all cases improvements occurred after i.m. administration of 3 doses of 150,000 IU of vitamin A each on alternate days. There were histories of liver disease, probably cirrhotic in nature, on the maternal side of the families of 3 of these patients. Slight abnormalities in adaptometric thresholds without disturbances in color vision were found in 4 other patients (3 males and 1 female). Two other male cirrhotics had red-green color blindness, the hereditary nature of which could not be ruled out. However, in 1 of these patients color blindness was associated with an increased adaptometric threshold which improved after vitamin A therapy.

2474 **STATISTICAL CRITERIA FOR QUANTITATIVE EVALUATION OF THE PROGNOSIS IN HEPATIC CIRRHOSIS.** *(It.)* Franzini, P. (Distr. Hosp., Saronno, Italy), E. Marubini, U. G. Cereda, P. E. Lucchelli and G. Navassa. *Minerva Med* 59(104):5839-5853, 1968.

Alcohol was the main cause of cirrhosis in 80.8% of 430 patients (354 males and 76 females) with cirrhosis and ascites seen between 1960 and 1966. Of these patients, 270 died. Causes of death were liver failure in 67.1%, extrahepatic causes in 22.2%, gastrointestinal bleeding in 9.6%, and delirium tremens in 1.17%. Associated diseases included cardiovascular disorders in 139 (32.3%), bronchopneumopathies in 91 (21.2%), kidney diseases in 22 (5.1%), gastric resections in 18 (4.3%), diabetes in 16 (3.7%), cerebrovascular disorders in 14 (3.3%), and neoplasms in 11 (2.6%). Of the total group, 39 (9.1%) developed hepatic comas, including 25 (9.3%) of those who died. Gastrointestinal bleeding occurred in 75 cases (17.5%), and polyneuropathies and/or muscular hypotrophy were present in 85%. After correcting for natural mortality, the method of Cutler and Ederer was used to construct 2 survival curves, one of which was based on the severity of ascites on admission and the other on the history of ascites. The 1st curve gave a median survival time of 1 yr 7 months and the 2nd curve a median survival time of 3 yr 2 months. A discriminant analysis of 23 variables was performed for patients with short survivals (3 months or less), moderately long survivals (3-12 months), and long survivals (more than 1 yr). The prognosis was correct for 77% of patients with short survival times, for 71% of those with moderately long survival times, and for only 47% of those with long survival times. Stepwise discriminant analysis of only 7 variables (alcoholism, spleen size, indirect serum bilirubin, erythrocyte sedimentation rate, blood sugar, color index, and serum albumin/globulin ratio) gave correct prognoses for 71% of the patients with short survival times.

2475 **SERIAL ASSESSMENT OF RETICULOENDOTHELIAL FUNCTION IN EXPERIMENTALLY INDUCED NUTRITIONAL CIRRHOSIS.** *(E.)* Ali, M. V. (Buffalo Gen. Hosp., N. Y.) and J. P. Nolan. *Lab Invest* 20(2): 184-189, 1969.

Hepatic reticuloendothelial clearance of ^{131}I-labeled, microaggregated albumin was measured in 62 female Holtzman rats on a high-fat choline-deficient diet from the early fatty-liver stage to cirrhosis. An identical, choline-supplemented (0.4% choline-chloride) diet was given to a control group of 62 rats. At the end of the first week, phagocytic function was significantly depressed in the choline-deficient rats, the half-time clearance of the aggregated albumin being prolonged almost 50%. Although a slight depression was noted at the end of the 2nd week, no difference was observed between the choline-deficient and choline-supplemented groups at 4, 8 or 15 weeks. When separated by gel chromatography, sera obtained 4-6 hr after the injection of the labeled test substance showed no difference in the proportion of free to bound iodide at any of the time periods. Histologically, the early depression in the function of the reticuloendothelial system occurred at a period of appreciable fatty metamorphosis, but it was not present later when the fatty change was most intense or when fibrosis developed. It is postulated that the early fatty infiltration causes a functional blockade of the Kupffer cells which interferes with normal function, but that a compensatory adjustment is made as the process continues. This early depression of the reticuloendothelial system may contribute to the ultimate development of cirrhosis.

2476 **THE ETIOLOGY OF HEPATIC CIRRHOSIS: CLINICAL AND STATISTICAL STUDIES ON 400 PATIENTS.** *(Ger.)* Gigglberger, H. (Barmherzige Brüder Hosp., Regensburg, Germany). *Acta Hepatosplen* 15(6):415-423, 1968.

Among the patients admitted to the medical clinic of Regensburg Hospital during the period 1953-59, 1.05% (1.68% of the males and 0.35% of the females) had laparoscopically diagnosed cirrhosis of the liver (septal, postnecrotic or mixed forms); from 1960 to 1966, an increasing number of patients (from 24 to 52/yr) were treated for cirrhosis in a special department of that hospital, so that a total of 400 cases (80.5% male, age range 5-88 yr but 77% between 50 and 70) could be collected for the 14-yr period. Statistical analysis of data obtained from these 400 cases confirms that the incidence of cirrhosis is increasing, without relation to constitutional type, family history, occupation (except as related to use of alcohol), or history of extrahepatic infectious disease, gastrointestinal disease (gastritis, colitis, ulcers, gastric surgery, cholecystitis, appendicitis), allergy, collagen disease, exposure to anesthesia, or poisoning. Alcoholism seems to play a definite and increasing role, 34% of the patients admitted during 1953-59 and 57.5% of those admitted during 1960-66 reporting heavy consumption of alcohol. There was also a high incidence of previous viral hepatitis (23.5%) and diabetes mellitus (11.25%). Dietary deficiencies, however, seem to be playing a less important role (6.5% reported a history of starvation during the war years). In many patients, more than one possible etiological factor was reported, but in 28.5%, there was no history of previous disease.

2477 **EFFECT OF LYMPH DRAINAGE ON PORTAL PRESSURE AND BLEEDING ESOPHAGEAL VARICES.** *(E.)* Kessler, R. E. (New York U. Sch. Med., N. Y.), E. Santoni, D. A. Tice and D. S. Zimmon. *Gastroenterology* 56(3):538-547, 1969.

The effect of thoracic duct lymph drainage on portal pressure and bleeding esophageal varices in 7 patients with cirrhosis has been evaluated. Four control patients with cirrhosis and bleeding varices were monitored in similar fashion without lymph drainage. Significant reductions in portal pressure were associated with hypovolemia from inadequate lymph replacement or recurrent hemorrhage from esophageal varices. The portal, central venous, and arterial pressures, urine output, and body weight remained unchanged when lymph was reinfused at the same rate as withdrawal. The functional thoracic duct pressure approached the central venous pressure. Lymph drainage did not appear to control hemorrhage from varices since bleeding continued or recurred in 4 patients while lymph was being drained.

2478 **INFARCTION-LIKE NECROSES OF THE CIRRHOTIC LIVER AFTER OPERATIVE PORTACAVAL SHUNT.** *(Ger.)* Dustmann, H. O. (Inst. Path., Free U. Berlin, Germany), J. Eckart, H. J. Gutzeit and K. J. Wollmann. *Langenbeck Arch Klin Chir* 323(2):124-141, 1968.

2479 **HEPATIC CIRRHOSIS WITH INTRAPULMONAR ARTERIOVENOUS MICROANASTOMOSES.** *(Ger.)* Irle, U. (Munic. Hosp., Bremen, Germany) and F. B. Ohlms. *Praxis* 57(49):1720-1722, 1968.

2480 **PHYSIOPATHOLOGY AND HEMODYNAMICS OF PORTAL HYPERTENSION.** *(Sp.)* Zeilikoff, R. (Fac. Med., Buenos Aires, Argentina). *Arq Gastroent* 6(1): 47-50, 1969.

2481 **JAUNDICE, HEMOLYSIS AND HYPERLIPIDEMIA IN ALCOHOLICS: ZIEVE'S SYNDROME. REPORT OF THREE CASES.** *(E.)* Paloheimo, J. A. (Maria Hosp., Helsinki, Finland) and A. Louhija. *Ann Med Intern Fenn* 57(3):129-133, 1968.

2482 **FLUID RETENTION AND THE SYNDROME OF RENAL FAILURE.** *(E.)* Baldus, W. P. (Mayo Clin., Rochester, Minn.). *Mod Treatm* 6(1):191-204, 1969.

2483 **SULFONAMIDE KINETICS IN LIVER INJURIES.** *(Ger.)* Held, H. (Med. Clin., U. Tübingen, Germany) L. von Berger and H. F. von Oldershausen. *Verh Deutsch Ges Inn Med* 74:1140-1143, 1968.

2484 **STUDIES OF THE L-CHAINS OF IgG IN NORMAL SUBJECTS AND PATIENTS WITH PLASMACYTOMA AND HEPATIC CIRRHOSIS.** *(Ger.)* Prellwitz, W. (2nd Med. Clin., Johannes Gutenberg U., Mainz, Germany), C. H. Hammar, W. Opferkuch and E. Köttgen. *Verh Deutsch Ges Inn Med* 74:509-512, 1968.

2485 **CHANGES IN THE PARTIAL PRESSURE OF OXYGEN IN ARTERIAL AND VENOUS BLOOD DURING HISTAMINE INFUSION IN CIRRHOTICS.** *(Ger.)* Baltzer, G. (Med. Clin., U. Marburg/Lahn, Germany), H. A. Schmidt and H. Arndt. *Verh Deutsch Ges Inn Med* 74:582-585, 1968.

2486 **THE DETECTION OF ANTIBODIES FOR INTERNAL MITOCHONDRIAL MEMBRANES IN SERA FROM PATIENTS WITH PRIMARY BILIARY CIRRHOSIS.** *(Ger.)* Berg, P. A. (Med. Clin., U. Tübingen, Germany), U. Muscatello, D. Doniach and I. M. Roitt. *Verh Deutsch Ges Inn Med* 74:527-529, 1968.

2487 **IS THERE A BLOOD CLOTTING FACTOR DEFICIENCY IN HEPATIC CIRRHOSIS?** *(Ger.)* Hörder, M. H. (Med. Clin., Justus Liebig U., Giessen, Germany), K. Huth, D. Heene, B. Leinweber and H. G. Lasch. *Verh Deutsch Ges Inn Med* 74:150-154, 1968.

2488 **MORTALITY EXPERIENCES OF MALE AND FEMALE ALCOHOLIC PATIENTS.** *(E.)* Schmidt, W. (Toronto Clin. Addiction Res. Found, P. Ont., Canada). and J. de Lint. *Quart J Stud Alcohol* 30(1A):112-118, 1969.

2489 **SUICIDE AND THE INTERACTION OF ALCOHOLISM (LIVER CIRRHOSIS) WITH THE SOCIAL SITUATION.** *(E.)* Rushing, W. A. (Mid-South Regional Med. Program., Vanderbilt U., Nashville, Tenn.). *Quart J Stud Alcohol* 30(1A):93-103, 1969.

2490 **CHANGES IN THE PLOIDY IN HEPATOCYTES DURING REGENERATION PROCESSES IN THE LIVER.** *(Rus.)* Khankhodzhaiev, A. Kh. (Res. Inst. Public Hlth., Min. Hlth. Uzbek SSR, Tashkent, USSR). *Med Zh Uzbek* 11:48-49, 1968.

2491 **DISTURBANCES OF BLOOD COAGULATION IN HEPATIC CIRRHOSIS.** *(Sp.)* Rios Mozo, M. (Inst. Gen. Path., Fac. Med. Sevilla, Spain), J. Gil Zaragueta and L. Garcia Hernández. *Rev Clin Esp* 110(1):21-36, 1968.

2492 **CLINICAL AND HISTOLOGICAL STUDIES OF CIRRHOSIS OF THE LIVER AT THE FIRST TOKYO NATIONAL HOSPITAL.** *(Jap.)* Sano, I. (1st Tokyo Natl. Hosp., Japan) and M. Kaneko. *Iryo* 22(11):1296-1307, 1968.

2493 **A CASE OF ZIEVE'S SYNDROME.** *(Fr.)* Pequignot, H. (Cochin Hosp., Paris, France), J. Guerre, J. J. Cocheton and B. Christoforov. *Cah Coll Med Hop Paris* 10(1):65-67, 1969.

2494 **POSTNECROTIC CIRRHOSIS CAUSED BY IPRONIAZID.** *(Sp.)* Muro, J. (La Paz Clin., Madrid, Spain), A. Schwarz, A. Diago and J. Ortiz-Vázquez. *Rev Clin Esp* 110(3):235-244, 1968.

2495 **SIX CASES OF HEPATIC HYDROTHORAX.** *(Sp.)* Rodrigo, G., J. M. (Fac. Med., U. Valencia, Spain), A. Benages M., J. Palao E., J. Torralbe A. and F. J. Garcia-Conde B. *Rev Esp Enferm Apar Dig* 28(3):345-354, 1969.

2496 **TREATMENT OF HEPATIC ASCITES WITH FURSEMIDA.** *(Por.)* Benvenuti, G. A. (Fac. Med., Fed. U. Rio Grande Sul., Brazil) and J. M. Job. *Hospital (Rio)* 74(5):1601-1638, 1968.

See also 2003,2066,2163

2497 **THE DIAMETER OF THE COMMON BILE DUCT AFTER TRANSDUODENAL PAPILLOTOMY.** *(Ger.)* Weber, F. (Prov. Hosp., Salzburg, Austria). *Wien Klin Wschr* 81(9):150-152, 154, 1969.

The diameter of the common bile duct was measured on cholangiograms made immediately before surgery and 4-8 yr later in 21 patients, 19-80 yr old, who were subjected to transduodenal papillotomy for papillary stones (12 cases), papillary stenosis (8 cases), and choledocholithiasis (1 case). After surgery, 15 of these patients had no symptoms, 5 had symptoms of pancreatic insufficiency, and 1 had occasional mild episodes of colic. The diameter of the common bile duct ranged from 10-17.5 mm before surgery and from 5-15 mm afterwards. After surgery the diameter decreased by 1-8.5 mm in 16 patients, increased by 1-2.5 mm in 4, and remained unchanged in 1. No relation was found between the change in the diameter of the common bile duct and the patient's age, type of obstruction, or residual symptoms.

2498 **PRIMARY CANCERS OF THE COMMON BILE DUCT: REPORT OF 16 CASES.** *(Fr.)* Hollender, L. F. (Hosp. Ctr., U. Strasbourg, France), M. Gillet and A. G. Weiss. *Arch Franc Mal Appar Dig* 57(12):985-1016, 1968.

Biliary tract cancer was diagnosed in 16 patients (10 men and 6 women, aged 42-72 yr) between 1956 and 1967; cholelithiasis was present in 3 of these cases. The tumor was located in the hepatic portal in 6 cases, in the common hepatic duct in 5, in the upper part of the common bile duct and juncture of the cystic and common bile ducts in 3, in the common hepatic duct and hepatic portal in 1, and in the lower part of the common bile duct in 1. On surgery 4 patients were found to have metastases (3 in the lesser omentum and 1 in the peritoneum) and 2 were inoperable. In 6 cases the tumor was removed and bile flow restored. Procedures employed included 3 hepaticojejunostomies, 1 hepaticoduodenostomy, 1 anastomosis of the hepatic and common bile ducts, and 1 intrahepatic cholangiojejunostomy. Palliative anastomoses were performed in 8 cases. With the exception of the 2 inoperable patients, who died 12 and 18 days after laparotomy, there were no operative deaths. The mean survival time was 12 months among patients whose tumors had been removed and 4 months among those treated palliatively.

2499 **INDICATIONS FOR AND RESULTS OF TRANSDUODENAL SPHINCTEROTOMY.** *(Ger.)* Bohmig, H. J. (1st Surg. Clin., U. Vienna, Austria), A. Fritsch, M. Kux and G. Stacher. *Langenbeck Arch Klin Chir* 323(3): 173-188, 1969.

In a 5-yr period, 858 operations on the biliary tract included 215 transduodenal sphincterotomies. This procedure was the operation of choice in both first and repeat operations on the common bile duct. The papilla and Oddi's sphincter were opened up so that an 8-10 mm catheter could be implanted comfortably into the common bile duct from below; fine catgut sutures were placed in the mucosa of the common bile duct and duodenum; transpapillary drainage was not employed. Of the 215 patients undergoing this procedure, 39 had papillary stenosis alone, 59 had papillary stenosis and choledocholithiasis, 41 had a stone wedged in the papilla, 9 had pancreatitis, and 61 had choledocholithiasis. There were 7 operative deaths (3.2%), 3 of which were complications of surgery (bile peritonitis, a retroduodenal abscess, and cholangitis and empyema). Among the 34 nonfatal postoperative complications there were only 3 cases of mild pancreatitis. Three patients developed duodenal fistulas; in 1 of these patients a fistula resulted in duodenal stenosis and necessitated a 2nd operation. There were 15 long-term deaths. Follow-ups on 183 patients showed that 162 (88.5%) were asymptomatic, 11 had symptoms referable to the biliary tract, and 4 had chronic pancreatitis. Repeat operations were performed in 6 cases. Only 3 of these patients had biliary tract disease (choledocholithiasis in 2 cases, stenosis of the common bile duct due to scar formation in 1). The remaining 3 patients had hepatitis, terminal ileitis, and a duodenal ulcer, resp. Duodenobiliary reflux was seen radiologically in 53 of 123 patients (43%) after surgery, but no evidence was found to suggest that reflux was responsible for postoperative symptoms. Measurements performed 2-5 yr after transduodenal sphincterotomy in 3 cases showed that the effect of this procedure on pressure in the common bile duct and flow through the papilla remained unchanged.

2500 **SERUM ENZYME ACTIVITIES IN CHILDREN WITH BILIARY DISEASES.** *(Ger.)* Sitzmann, F. C. (Pediat. Clin., U. Erlangen, Germany). *Z Gastroent* 6(6): 418-422, 1968.

Serum enzyme activities were determined on 12 children with biliary tract atresia or intrahepatic cholestasis, 1 with a cyst of the common bile duct, 2 with cholelithiasis, and 3 with cholecystitis. Glucose dehydrogenase activities were elevated in all children with biliary obstructions and cholestasis. The activity of this enzyme usually increased with the onset of symptoms. Leucine aminopeptidase and alkaline phosphatase activities also increased, but later than glucose dehydrogenase activities. No increases in glucose dehydrogenase activities were found in serum from children with cholecystitis or cholangitis. Glucose dehydrogenase and leucine aminopeptidase activities were lower than those which have been reported for adults with biliary tract obstructions. Determination of serum glucose dehydrogenase activities is recommended as a sensitive criterion for biliary tract obstruction. Other advantages are that the activity of this enzyme is not affected by hemolysis and serum can be stored at 0-4C for more than 52 hr without much change occurring in its activity.

2501 **A STUDY OF THE SUITABILITY OF RONDOMYCIN FOR THE TREATMENT OF BILIARY TRACT INFECTIONS.** *(Pol.)* Tuszkiewicz, A. R. (2nd Clin. Int. Dis., Acad. Med. Lublin, Poland), L. Wojdylo, M. Tuszkiewicz and L. Perlinska-Schnejder. *Pol Tyg Lek* 24(2): 58-60, 1969.

After *in vitro* sensitivity tests on 92 strains of microorganisms isolated from the bile of patients with chronic biliary tract disease had shown that only 57 strains were resistant to rondomycin (including 10 which were resistant to all 7 antibiotics tested), this antibiotic was subjected to a clinical trial in 35 patients (20 men and 15 women, 22-58 yr old) with chronic biliary tract infections, associated in 16 cases with other types of biliary tract disease. Of the 92 strains isolated, 62 were sensitive to streptomycin, 62 to chloromycetin, and 21-28 to penicillin, erythromycin, aureomycin and/or terramycin. Totally resistant strains included 5 of 34 strains of *Escherichia coli*, 2 of 33 strains of *Enterococcus*, and 2 of 8 strains of *Aerobacter aerogenes*, but none of the *Proteus* or *Streptococcus*. Among the 35 patients, 13 yielded cultures of *E. coli* (8 of which responded to treatment), 12 yielded cultures of *Enterococcus* (11 of which responded), 4 yielded cultures of *Aerobacter aerogenes* (none of which responded), and 4 yielded cultures of *Staphylococcus aureus* (3 of which responded). Cures were obtained in a total of 24 cases, including 16 of those with simple infections and 8 of those with associated conditions. There were no side effects.

2502 BILIARY EXCRETION OF RIFAMYCIN SV IN THE PERFUSION OF ISOLATED SWINE LIVER. *(Fr.)* Chevrel, J. P. (St. Antoine Hosp., Paris, France), P. Opolon and P. Hadchouel. *Presse Med* 77(19):721-722, 1969.

After ligating the cystic duct and rinsing with sterile heparinized Ringer's solution for 10-15 min, the livers of young swine, weighing 25-35 kg, were perfused with 1600 ml of oxygenated blood at 38C through 2 metal cannulas in the portal vein and hepatic artery and a plastic cannula in the vena cava connected to a flexible catheter in the common bile duct. During the rinsing process 10 mg/kg of rifamycin SV were introduced. In kidneys saturated with rifamycin SV bile flow and ammonia clearance after loading with 500 mg of ammonium acetate were normal, but BSP retention was high, probably because the antibiotic and BSP compete for excretion by the liver. This would account for transitory jaundice observed during rifamycin SV therapy. However, it is concluded that the use of rifamycin SV is justified in treating biliary tract infections in patients with no hepatic abnormalities because of the rapid biliary excretion of this drug.

2503 TRAUMA TO THE EXTRAHEPATIC BILE DUCTS DURING BILIARY TRACT SURGERY AND ITS IMMEDIATE REPAIR. *(Fr.)* Mouchet, A. (Foch Ctr. Med. Surg., Suresnes, France), J. Marquand, J.-P. Garcin and M. Guivarc'h. *Mem Acad Chir (Paris)* 94(4/5):173-182, 1968.

Case reports are presented for 9 patients (7 women and 2 men, aged 42-69 yr) who were operated on for cholelithiasis. In 7 cases trauma involved the hepatic and common bile ducts and in 2 cases, the right hepatic duct. Repair consisted of end-to-end anastomosis. Sutures were always made over a protective drain which was allowed to remain in place for 13 days to 5 months. In 6 cases the vertical arm of a Kehr tube was inserted into the common bile duct through a small incision made just below the anastomosis. There were no operative deaths. Observations made for 6 months to more than 9 yr showed that 7 operations gave good results and 2 were failures. A hard stenotic nodule developed in the anastomosis 3 yr after surgery in 1 patient who was reoperated for episodes of jaundice. This was treated successfully by dilatation and insertion of a Kehr tube. In the other case, bile leakage was noted immediately after surgery and, 4 months later, obstructive jaundice. A hepaticojejunostomy was performed.

2504 OVERLOOKED AND RECURRENT LITHIASIS OF THE COMMON BILE DUCT. *(Fr.)* Garbay, M. and F. Poilleux. *Mem Acad Chir (Paris)* 94(25/26):703-707, 1968.

In 54 of 299 cases in which choledocholithiasis was found at surgery recurrent or overlooked stones were found after the 1st operation had been performed. Of these, 40 were considered to be overlooked stones. In 5 cases stones were known to be present but were left behind because of the poor general condition of the patient or biliary peritonitis. Three of these 5 patients died. Stones were accidentally left behind in 30 cases because of the lack of surgical or radiological exploration (2 cases), the failure to perform surgical cholangiography (3 cases), and misinterpretation of surgical cholangiography and pressure measurements (4 cases). In 3 cases overlooked stones were found when surgery was performed for other purposes. In 5 cases no stones were found and symptoms were due to other causes (anomalies or compression of branches of the hepatic duct, sclerotic odditis, angiocolitis). Recurrent lithiasis occurred in 14 cases. In 6 cases odditis was found which was treated by sphincterotomy in 3 cases and by making a biliodigestive anastomosis in 3 cases. One of these patients died of acute necrotic pancreatitis. Three other patients developed chronic pancreatitis and were treated by choledochoduodenal anastomosis (2 cases) or sphincterotomy (1 case). In 5 other cases lesions of the common bile duct could not be definitely diagnosed.

2505 THE INCIDENCE OF BILIARY SEPSIS FOLLOWING SURGERY ON THE EXTRAHEPATIC BILE DUCTS. *(Fr.)* Jouanneau, P. (Charles Nicolle Hosp., Rouen, France), J. Larcher and F. Cottard. *Acta Chir Belg* 67(9):915-925, 1968.

Bacteriological studies on gallbladder bile obtained from 139 patients subjected to surgery on the extrahepatic biliary tract (cholecystectomy, choledochotomy, sphincterotomy, choledochoduodenostomy) revealed 83 cases with sterile bile, 34 with *Escherichia coli* in the bile, 18 with enterococci, 5 with *Proteus* sp., 3 with pathogenic staphylococci, 2 with *Klebsiella* sp., 1 with *Salmonella typhosa* and 1 with *Salmonella paratyphi* B; none of these microorganisms were true anaerobes, and in 85% of the cases the bile contained only one species of microorganisms. Although jaundice was present in 44.6% of those with biliary sepsis and 17.8% of those with sterile bile, and chills and fever were reported by 52.8% and 28.5%, resp., there was not a good correlation between the clinical and bacteriological findings. Biliary sepsis was associated, however, with an increased incidence of postoperative complications, particularly thrombosis. Of the 139 patients, 13 died and 20 (including 13 with biliary sepsis) had complications; all 7 with complications following surgery on the common bile duct had biliary sepsis. Whereas 73.7% of those with sterile bile had normal blood coagulation parameters, only 49% of those with biliary sepsis had normal blood coagulation while 45% showed hypercoagulability and 6% had thrombotic complications despite prophylactic treatment. In a later group of 138 patients, combined therapy with antibiotics and anticoagulants (rifamycin and heparin or Pindione) was successful in reducing the incidence of thrombotic complications to 2.3% among those with biliary sepsis and in shortening the hospital stay among those with biliary sepsis from 21-39 days to 18-28 days (compared to 14-26 days for patients without biliary sepsis).

2506 **ROLE OF THE SPHINCTER OF ODDI IN THE MECHANICS OF BILE SECRETION. THE TREATMENT OF GALLBLADDER DISEASES WITH A SELECTIVE SPASMOLYTIC ACTING ON THE SPHINCTER OF ODDI.** *(Sp.)* Galan Navarro, J. L. (Hermanos Azar Clin., I.N.P., Madrid, Spain). *Rev Esp Enferm Apar Dig* 27(9):1339-1358, 1968.

The choleretic agent Bilicanta (methylumbelliferone; 6 200-mg tablets daily for 20-60 days) was used in the treatment of 70 patients (7 men and 63 women, 22-67 yr old) with hepatobiliary diseases (25 with biliary dyskinesia, 23 with cholelithiasis, 7 with hepatobiliary dyspepsia, 2 with migraine, 8 with postcholecystectomy syndromes, and 5 with malformations of the gallbladder). These patients had had symptoms for from 15 days to 36 yr (average 12.33 yr), and 50% had had symptoms for more than 15 yr. There were no side effects. Results were excellent-good in 54 patients, fair in 9, and negative in 7. The agent was relatively ineffective in migraine and morphological anomalies of the gallbladder, and was only moderately effective in hypertonic dyskinesia. It is concluded that methylumbelliferone is an effective therapeutic agent for patients with certain types of hepatobiliary diseases, and that the sphincter of Oddi must therefore play an important role in the physiopathology of these diseases. The physiology of biliary secretion and gallbladder contraction is reviewed.

2507 **PERSONAL EXPERIENCE WITH PAPILLOSPHINCTEROTOMY.** *(It.)* Bayon, A. (United Hosp., Arezzo, Italy), E. R. Bonfigli and O. Ottaviani. *Acta Chir Ital* 24(4):507-532, 1968.

2508 **BILOBATE GALLBLADDERS.** *(Ger.)* Mincsev, M. (2nd Surg. Clin., U. Budapest, Hungary). *Zbl Chir* 93(46):1597-1609, 1968.

2509 **SPONTANEOUS BILIODIGESTIVE FISTULAS IN OBSTRUCTIVE CHOLEDOCHOLITHIASIS.** *(Ger.)* Lechner, G. (1st Surg. Clin., U. Vienna, Austria) and H. J. Böhmig. *Zbl Chir* 93(46):1593-1597, 1968.

2510 **ODDI SPHINCTEROTOMY WITHOUT CHOLEDOCOTOMY OR EXTERNAL BILIARY DRAINAGE.** *(Fr.)* Goinard, P. and G. Pélissier. *Mem Acad Chir (Paris)* 94(27/28):798-804, 1968.

2511 **ONE CASE OF A SHORT COMMON BILE DUCT.** *(Fr.)* Reignier, J. *Mem Acad Chir (Paris)* 94(29):850-851, 1968.

2512 **TWO CASES OF SURGICAL TRAUMA TO THE COMMON BILE DUCT.** *(Fr.)* Reignier, J. *Mem Acad Chir (Paris)* 94(29):848-850, 1968.

2513 **ROLE OF THE GALLBLADDER IN THE POST-CHOLECYSTECTOMY SYNDROME.** *(Fr.)* Mallet-Guy, P., J. Murat and M. Chrzanowska. *Mem Acad Chir (Paris)* 94(27/28):829-833, 1968.

2514 **ANALYSIS OF THE PATHOGENESIS OF THE POST-CHOLECYSTECTOMY OR SO-CALLED POST-CHOLECYSTECTOMY SYNDROME.** *(Fr.)* Monod, E. (Hosp. Ctr., Avignon, France). *Sem Hop Paris* 45(3):199-207, 1969.

2515 **MANAGEMENT OF ACUTE CHOLECYSTITIS.** *(E.)* Heifetz, C. J. (St. Louis, Mo.). *J Abdom Surg* 11(3):63-66, 1969.

2516 **GALLSTONE OBSTRUCTION OF THE SECOND PORTION OF THE DUODENUM. [CASE REPORT]** *(E.)* Milstoc, M. (New York U. Med. Ctr., N. Y.), A. R. Berger and J. Finkel. *Amer J Dig Dis* 14(2):143-147, 1969.

2517 **IDIOPATHIC CYSTIC DILATATION OF THE COMMON BILE DUCT.** *(Gr.)* Bonellos, K. and Kh. Oikonomidis. *Acta Chir Hellen* 95(4):613-618, 1968.

2518 **A CASE OF VOLVULUS OF THE GALLBLADDER TREATED BY CHOLECYSTECTOMY.** *(Gr.)* Asteriadis, D. I. *Acta Chir Hellen* 95(4):490-492, 1968.

2519 **A CASE OF ECHINOCOCCOSIS OF THE GALLBLADDER.** *(Gr.)* Messaris, G., I. Papadimitriou and A. Bouradas. *Acta Chir Hellen* 95(5):720-725, 1968.

2520 **BENIGN STRICTURE OF THE COMMON DUCTS. [CASE REPORT]** *(E.)* Nardell, S. G. (Whipps Cross Hosp., London, England). *Brit J Clin Pract* 23(1):34-35, 1969.

2521 **VARIATIONS IN THE ANATOMY OF THE EXTRAHEPATIC BILE DUCTS.** *(Ser.)* Keros, P. and P. Rudan. *Lijecn Vjesn* 90(8):783-787, 1968.

2522 **CLINICAL AND RADIOLOGICAL EVALUATION OF THE FUNCTIONAL STATE OF BILIODIGESTIVE ANASTOMOSES.** *(Rus.)* Grishkevich, A. M. (A. V. Vishnevskii Inst. Surg., Acad. Med. Sci. USSR, Moscow) and V. A. Vishnevskii. *Klin Khir (Kiev)* (10):22-27, 1968.

2523 **INDICATIONS FOR THE CREATION OF GALLBLADDER FISTULAS IN ACUTE CHOLECYSTITIS.** *(Rus.)* Zhitniuk, R. I. (S. M. Kirov Timofeiev Acad. Milit. Med., Leningrad, USSR) and N. S. Timofeiev. *Vestn Khir Grekov* (10):26-30, 1968.

2524 **CARCINOID OF THE AMPULLA OF VATER.** *(It.)* D'Alonzo, U. (S. Gerardo dei Tintori Hosp., Monza, Italy) and S. Sordo. *Osped Ital Chir* 19(3):261-266, 1968.

2525 **LEIOMYOMA OF THE GALLBLADDER: REPORT OF A CASE.** *(It.)* Gava, L. (Dept. Surg., U. Bologna, Italy) and C. Cinti. *Minerva Chir* 23(22):1209-1217, 1968.

2526 **REFELECTIONS ON GALLSTONES.** *(E.)* Zollinger, R. M. (Ohio State U. Coll. Med., Columbus) and R. K. Tompkins. *Postgrad Med* 45(3):73-78, 1969.

2527 **CHOLECYSTODUODENAL ANASTOMOSIS BY THE TUBULOPAPILLARY PROCESS.** *(Por.)* Mammana, C. Z. (Santa Casa Med. Sci., São Paulo, Brazil). *Folha Med* 57(4):55-62, 1968.

2528 **GASTRIC STENOSIS AS A COMPLICATION OF CHOLELITHIASIS.** *(Fl.)* van Damme, J. (Lange Leemstraat 255, Antwerp, Belgium), T. Snoeks and J. Gerard. *T Gastroent* 11(6):584-592, 1968.

2529 **ACUTE NONCALCULOUS CHOLECYSTITIS.** *(Ger.)* Isler, M. (Cantonal Hosp., Aarau, Switzerland). *Schweiz Med Wschr* 99(4):115-120, 1969.

2530 **EARLY RELAPAROTOMY IN THE SURGERY OF EXTRAHEPATIC BILIARY PATHWAYS.** *(E.)* Lorenc, J. (Charles U., Prague, Czechoslovakia). *Acta Univ Carol Med Monograph* 30:1-180, 1967.

2531 **RESIDUAL LITHIASIS OF THE COMMON BILE DUCT.** *(Sp.)* Ordóñez Acuña, A. *Cir Cir* 36(5):475-478, 1968.

2532 **BENIGN STENOSIS OF THE BILIARY DUCTS.** *(Sp.)* Santillán V., M. *Cir Cir* 36(5):468-474, 1968.

2533 **TACTICS AND RESULTS OF ACUTE CHOLECYSTITIS TREATMENT.** *(Rus.)* Lupinskii, M. I. (Kirov Munic. Hosp., USSR), O. N. Ivanitskaia, V. N. Nazarova and M. V. Sheinkman. *Khirurgiia (Moskva)* 44(12):58-62, 1968.

2534 **TREATMENT OF ACUTE CHOLECYSTITIS.** *(Rus.)* Tregubov, G. S. (No. 40 Hosp, Acad. Med. Sci. USSR, Gorky) and Che-Vangyn'. *Khirurgiia (Moskva)* 44(12):54-58, 1968.

2535 **A STATISTICAL STUDY OF 100 CASES OF RESIDUAL CALCULI.** *(Fr.)* Salembier, Y. (City Hosp., Lille, France). *Ann Chir* 22(25/26):1487-1490, 1968.

2536 **SURGERY [OF THE COMMON BILE DUCT].** *(Fr.)* Monod-Broca, P. (Bicetre Hosp., France). *Ann Chir* 22(25/26):1501, 1968.

2537 **RESIDUAL LITHIASIS OF THE COMMON BILE DUCT.** *(Fr.)* Bismuth, H. (Bichat Hosp., Paris, France). *Ann Chir* 22(25/26):1491, 1968.

2538 **CHOLEDOCHAL DISTOMIASIS DISCOVERED BY OPERATIVE CHOLANGIOGRAPHY IN LITHIASIC CHOLECYSTITIS.** *(Fr.)* Vayre, P. (Vaugirard Clin. Ther. Surg., Paris, France) and B. Robin. *J Chir (Paris)* 96(6):553-556, 1968.

See also 2011,2016,2028,2111,2196,2197,2302

2539 **STUDIES ON THE INCIDENCE OF INTESTINAL PARASITES IN THE DRESDEN POPULATION AND THE VALUE OF SOME COMMONLY USED PROCEDURES FOR DETECTING INTESTINAL PARASITES OR THEIR SEXUAL PRODUCTS IN HUMAN STOOLS. 1. THE INCIDENCE OF INTESTINAL HELMINTHS IN THE DRESDEN POPULATION AND A COMPARISON OF THE SENSITIVITY OF VARIOUS DIAGNOSTIC METHODS.** *(Ger.)* Müller, W. A. (Inst. Med. Microbiol. Epidem. Carl Gustav Carus Med. Acad., Dresden, Germany). *Deutsch Gesundh* 24(7):325-327, 1969.

Stool specimens from 793 adults working in the food industry were examined for intestinal parasites using native preparations, thick smears, and 2 concentration methods. Parasites were found in 87 (10.97%) of these subjects. They included 57 with *Enterobius vermicularis,* 13 with *Trichuris trichiura,* 9 with *Ascaris lumbricoides,* 7 with *Taenia* spp., and 1 with a combination of *Enterobius* and *Trichuris.* From these data it is estimated that 1.1% of the inhabitants of Dresden are infested with *Ascaris,* 1.6% with *Trichuris,* more than 0.9% with *Taenia,* and more than 7.2% with *Enterobius.* Hein's method, which employs thick smears, was found to be the most sensitive of the 4 methods tested.

2540 **RESTORATION OF INTESTINAL MOTILITY AND EVACUATION AFTER PARESIS BY A COMBINATION OF ELECTRICAL STIMULATION OF THE INTESTINE AND VISHNEVSKII'S LUMBAR PROCAINE BLOCK.** *(Rus.)* Vishnevskii, A. A. (A. V. Vishnevskii Inst. Surg., Acad. Med. Sci. USSR, Moscow), A. V. Livshits, B. I. Khodorov, V. A. Kolpachkov and V. A. Toritsyn. *Eksp Khir Anest* 13(6):9-12, 1968.

Electrical stimulation of the small and/or large intestine was used in the treatment of 20 patients who developed intestinal paresis after abdominal surgery. In addition, conventional methods were used on 10 of these patients and A. V. Vishnevskii's lumbar procaine block was used in the other 10. Square waves with potentials of 5-30 V, a frequency of 10-50 cycles/sec, and a duration of 5μ sec were applied for 3 min with 5-min intervals for the first 30 min and with 10-min intervals for the next 30 min. In the 1st group, peristalsis was restored 10-30 min after the beginning of electrical stimulation, but only 2 patients defecated spontaneously after 10-24 hr. In the other group the procaine block alone did not produce peristalsis. However, when combined with electrical stimulation, all 10 patients, including 1 with peritonitis, passed stools and gas within 7-30 min after the beginning of stimulation.

2541 **EXPERIMENTAL SURGERY FOR DELAYING INTESTINAL TRANSIT AFTER EXTENSIVE RESECTIONS.** *(Ger.)* Schima, E. (1st Surg. Clin., U. Vienna, Austria). *Langenbeck Arch Klin Chir* 323(3):246-262, 1969.

Rats were subjected to total colectomy in combination with 1) implantation of an isoperistaltic segment of ileum 2-3 cm long, 2) implantation of an antiperistaltic segment of ileum 2-3 cm long, 3) implantation of an antiperistaltic segment of ileum 5-6 cm long, 4) Noble's plication of the small intestine, or 5) implantation of an antiperistaltic segment of ileum 10-12 cm long. All animals in group (5) died of ileus. The time required for ingested barium sulfate to appear in the stools was measured in the 5 surviving animals in the remaining 4 groups and compared with that of colectomized controls. Analysis of variance showed that not all procedures had the same effect on intestinal transit. A comparison of these procedures by Duncan's method revealed that intestinal transit was slowest in animals in group (3) followed by those in group (2) and group (4). No significant difference was found in intestinal transit between colectomized controls and animals in group (1). Only rats in which inverted segments of ileum had been implanted had solid, formed stools. Autopsies performed 6 months after surgery showed that 9 of the 10 animals in groups (2) and (3) had stercoraceous ulcers in the inverted ileum due to coprostasis. Only a few thin adhesions formed between the loops of the small intestine in rats subjected to Noble's procedure.

2542 **HISTAMINE LIBERATION AND GASTRIC SECRETION DURING ANESTHESIA WITH PROPANIDID (EPONTOL).** *(Ger.)* Lorenz, W. (Surg. Clin., U. Munich, Germany), A. Doenicke, S. Halbach, I. Krumey and E. Werle. *Klin Wschr* 47(3):154-157, 1969.

Propanidid (7 mg/kg) was given i.v. over a period of 20 sec to 13 normal males, aged 22-25 yr. When given without atropine premedication, propanidid reduced blood pressure and the pH of the gastric juice and increased blood histamine levels by 30% after 10-20 min. Very rapid injections of propanidid produced even higher blood histamine levels. Administration of 0.5 mg of atropine i.v. 15 min before injection of propanidid had little effect on blood histamine levels and only reduced gastric secretion slightly. Injections of Cremophor-El, the solvent usually used for propanidid, produced no significant changes in blood pressure, the pH of the stomach contents, or blood histamine levels. Thus, histamine may be liberated either by propanidid or by one of its metabolites. On the basis of these findings it is recommended that both atropine and an antihistamine be given before propanidid is injected.

2543 **ACUTE NECROTIZING ENTERITIS AND COLITIS: AN ATTEMPT TO CLASSIFY THEM AND FIND THEIR CAUSE. CLINICAL STUDY OF 8 CASES.** *(Fr.)* Liaras, H. (Edouard Herriot Hosp., Lyon, France), J. H. Neidhardt, J. P. Tairraz, F. Lesbros and G. Guelpa. *J Chir (Paris)* 96(6):501-518, 1968.

Case reports are presented for 5 patients with gangrenous colitis, 2 with enterocolitis, and 1 with enteritis. Patients included 6 men and 2 women, aged 40-74 yr. Etiological factors included salicylates and phenylbutazone, corticosteroids, trauma and infection, amebiasis, an adenocarcinoma of the transverse colon and ileocecal valve, venous thrombosis of the colon and ileitis, volvulus of the sigmoid, and ischemia of the small intestine. *Clostridium* was isolated in 3 cases. Hyperbaric oxygen therapy was successful in 2 of these patients. There were 4 operative deaths, all in patients over 60 yr old.

2544 **CHANGES IN THE DIGESTIVE TRACT OF DOGS AFTER ADMINISTRATION OF ETHIONINE.** *(Pol.)* Legiewski, A. (Inst. Path. Anat., Acad. Med.

Lodz, Poland), I. Cyperling, J. Kuźmicka, W. Torzecka and Z. Torzecki. *Pat Pol* 19(3/4):507-515, 1968.

In 35 dogs, daily administration of aqueous ethionine at a dosage of 20 mg/kg body weight i.v. for 1-21 days was followed by a progressive loss of appetite, weakness and decrease in body weight. Fecal amylase and trypsin activities decreased after a few days and remained at very low levels for the last 2 weeks of the experiment. Histological studies of animals sacrificed after 1-21 days, in comparison with tissue samples from 11 controls, revealed pathological changes throughout the digestive tract, varying in intensity with the total dose administered. These studies revealed 3 general stages in the development of ethionine-induced lesions in the gastrointestinal tract: 1) superficial inflammation of the mucosa (for the 1st 7 days), 2) deep inflammation (8th-14th day), and 3) fibrosis with proliferation of elements of the lymphatic system (15th-21st day).

2545 INTESTINAL LOSS OF SERUM PROTEINS IN INFANTS AND CHILDREN. *(Pol.)* Modzelewska, I. (2nd Pediat. Clin., Acad. Med. Lublin, Poland). *Pediat Pol* 43(3):277-282, 1968.

Intestinal protein loss was studied by means of immunoelectrophoresis (method of Scheidegger) in 15 infants with acute or toxic diarrhea, 1 case of idiopathic hypoproteinemia, and 4 cases of mucoviscidosis; pathogenic microorganisms isolated from these children included *Escherichia coli* (8 cases), *Shigella sonnei* (2 cases), and *Salmonella enteritidis* (2 cases). Serum protein fractions were detected in the feces in 12 cases of diarrhea, the 1 case of hypoproteinemia, and 3 of the children with mucoviscidosis. All but 1 of these (with *E. coli* diarrhea) excreted albumin the feces, 3 (all with acute infectious diarrhea) excreted haptoglobin, 7 (including 5 with acute and 2 with toxic diarrhea) excreted α-macroglobulin, all but 1 (with toxic diarrhea) excreted transferrin, all but 1 (with mucoviscidosis) excreted immunoglobulin G, and 8 (including 6 with diarrhea, 1 with hypoproteinemia and 1 with mucoviscidosis) excreted immunoglobulin M, but only 1 patient (with toxic diarrhea) excreted immunoglobulin A. All 12 infants and children excreted at least two types of serum protein, and most excreted 4 or 5 types.

2546 FECAL EXCRETION OF SERUM PROTEINS IN HEALTHY CHILDREN AND IN CERTAIN DISEASES AS REVEALED BY IMMUNOCHEMICAL STUDIES. *(Pol.)* Hager-Malecka, B. (Pediat. Clin., Silesian Acad. Med., Zabrze, Poland), Z. Szczepanski and A. Kobierska-Szczepanska. *Pediat Pol* 43(3):265-276, 1968.

Fecal loss of serum protein was evaluated by means of a modified double immunodiffusion technique in 15 healthy infants (1 month to 3 yr of age) and 31 infants (2 weeks to 3 yr of age) with diarrhea, hypoproteinemia or malnutrition. The number of proteins excreted was then studied by means of immunoelectrophoresis. Fecal protein loss was 38-1520 mg/100 g feces in 16 children with diarrhea, compared to 19-190 mg% in 7 children after diarrhea had been successfully treated, 76-1520 mg% in 8 children with malnutrition, 76-3040 mg% in 7 children with hypoproteinemia, and 19-190 mg% in normal controls. Average values were 4-10 times as high in children with gastrointestinal disorders as in normal children, and the immunoelectrophoretogram was also denser in the ill children. Thus, while 13 of the 15 controls showed 1-3 lines in the immunoelectrophoretogram, and 5 of the 7 children in whom diarrhea had been treated showed 2-4 lines (no precipitation lines in the others), the affected children showed 1-10 lines, and 21 of the 31 had more than 2 precipitation lines.

2547 CLINICAL AND PATHOLOGICAL-ANATOMICAL FINDINGS IN INFANTS WITH PNEUMATOSIS CYSTOIDES INTESTINALIS. *(Pol.)* Golinska, A. (Munic. Children's Hosp., Torun, Poland) and A. Raczynska. *Pediat Pol* 43(5):563-571, 1968.

The 25 infants (16 males and 9 females) with pneumatosis cystoides intestinalis seen at Torun Hospital during the period 1960-65 represented 5.75% of the autopsy material collected during that period. The group included 7 newborns, 15 in the first 3 months of life, and 3 in the 2nd trimester; the annual incidence generally paralleled the incidence of infantile diarrhea. Analysis of the clinical and autopsy findings and particularly of the results of histopathological studies (performed in 22 cases) indicates that cases of pneumatosis cystoides intestinalis can be divided into 3 main groups on the basis of the degree of inflammation and infiltration. It is concluded that a number of factors besides malnutrition and a general lowering of bodily resistance are important in the pathogenesis of this disease, e.g.: infection with staphylococci or pathogenic *E. coli,* disturbances in the intestinal flora with an increase in monilia, disturbances in peristalsis, and increases in the activity of the abdominal musculature accompanying respiratory tract disease.

2548 OPTIMAL DOSAGE OF AMPICILLIN FOR SHIGELLOSIS. *(E.)* Haltalin, K. C. (Southwestern Med. Sch., Dallas, Tex.), J. D. Nelson, H. T. Kusmiesz and L. V. Hinton. *J Pediat* 74(4):626-631, 1969.

Oral ampicillin (50 mg/kg/day for 5 days in 30 cases and 100 mg/kg/day in 33) was given to 63 infants and children hospitalized for severe shigellosis. There were no statistically significant differences between the two dosage groups with respect to bacteriologic cure rates or clinical responses. Superinfection with *Candida* species occurred less commonly in patients who received the lower dosage. Daily observations as to persistence of fever, diarrhea, and positive stool cultures were then compared in 103 hospitalized patients receiving either of the two dosage schedules of oral ampicillin, i.m. ampicillin (24 cases) or placebo (16 cases). All 3 modes of ampicillin therapy were effective in the treatment of shigellosis when the infecting organism was susceptible. Parenteral administration resulted in a significantly more rapid response and is therefore recommended for the severely ill patient. For others, although there was a tendency to a slower response than with 100 mg/kg/day, the lower oral dosage of ampicillin is satisfactory.

2549 BLUNT TRAUMA TO THE ABDOMEN. *(Ger.)* Matthes, R. (Health Ctr., Konigswusterhausen, Germany) and W. Wolf. *Zbl Chir* 93(12):444-447, 1968.

During the period 1952-67, 75 patients (66 males and 9 females, including 45 under 30 yr of age) were operated on for blunt injury to the abdomen, due mostly to traffic accidents (40 cases), industrial accidents (14 cases), or injuries caused by horses or bulls (10 cases). Laparotomy revealed injuries to the small intestine in 19 cases, the liver in 18, the spleen in 17, the kidneys in 6 and the colon in 5 (including 2 with injuries to the appendix). In addition, 30 patients had extra-abdominal injuries which complicated the diagnosis and management. In view of the frequent presence of shock and other injuries, the proper diagnosis of blunt abdominal trauma requires (whenever possible in the emergency situation) careful observation of the general condition, repeated abdominal palpation, auscultation and percussion, rectal examination, continuous recording of the pulse and blood pressure, repeated determination of the hematological parameters and corss-matching, measurement of the axillary and rectal temperature, urinalysis, gastric secretion studies, abdominal X-ray, intravenous pyelography, and sometimes puncture of the Douglas space. Laparotomy is also recommended whenever needed to verify a diagnosis. Among the 75 patients reported, 10 died, all after a correct diagnosis had been established. Some of the unusual findings in cases of this type and some of the complications which hamper their diagnosis and treatment are discussed and illustrated by two case reports.

2550 ATTEMPTED CONSERVATIVE TREATMENT OF CHRONIC *SALMONELLA* CARRIERS. *(Sl.)*

Hrúzik, J. (Med. Fac., Comensky U., Bratislava, Czechoslovakia), J. Karolček, P. Černák and I. Odler. *Bratisl Lek Listy* 49(2): 180-189, 1968.

Various combinations of antibiotics were tried in the conservative treatment of 176 *Salmonella* carriers (46 men and 130 women, mostly 30-59 yr old), including 162 carrying *S. typhi* or *paratyphi;* the organism could be isolated from the bile in 161 of the 176 cases. Among 101 carriers who were treated with penicillin (either 3-5 million U/day plus streptomycin or sulfathiazole, or 18 million U/day for 8 days with Benemide), 34 became permanently negative. One of 10 patients who were treated with ampicillin (6-10 g/day p.o. for 10 days) and 3 of 9 who were treated with tetracyclines (30 mg/kg/day p.o. for 10-14 days) plus chloramphenicol (50 mg/kg/day p.o.) also became permanently negative. There were no successes, however, among 5 cases treated with methacillin plus streptomycin, 21 treated with chloramphenicol alone, 2 given neomycin alone, 41 treated by immunotherapy (autovaccines), and 2 treated with bacteriophage. *Salmonella* carriers with associated diseases, such as cholelithiasis, chronic inflammation, or anomalies of the biliary and urinary tracts, were much more resistant to treatment and generally required surgical intervention.

2551 BENIGN TUMORS OF THE DIGESTIVE TRACT. *(Ger.)*

Linder, F. (Surg. Clin., U. Heidelberg, Germany) and K. H. Grozinger. *Langenbeck Arch Klin Chir* 322(Kongressber.):94-107, 1968.

Among 185,157 patients treated at the Surgical Clinic of Heidelberg during the period 1943-67, there were 6385 with malignant and 323 with benign tumors of the digestive tract. Thus, benign tumors accounted for about 5% of all gastrointestinal neoplasms, but these were characterized by a marked tendency toward malignant degeneration and the development of complications. Furthermore, a comparable autopsy series yielded 563 malignant and 323 benign digestive tract neoplasms, indicating that the ratio between benign and malignant gastrointestinal neoplasms is actually about 1:2, the rarity of clinically recognized benign tumors being due to the fact that only about 1 in 20 produces symptoms. In both series, totalling 646 benign tumors of the digestive tract, about 88% were epithelial lesions, the rest being mesenchymal and neurogenic tumors. Among the benign tumors, 19% were in the stomach, 12% in the colon and 63% in the rectum, while the comparable figures for malignant tumors were 44%, 10% and 36%, resp. Polyps were usually found in the stomach and rectum, myoma and neurinoma in the stomach, and carcinoid tumors in the small intestine; benign esophageal tumors were very rare and were mostly leiomyomas. The age curve showed 2 peaks, one for children due mostly to rectal polyps and one between the ages of 51 and 70 yr. The operative mortality averaged 1.9%, varying with the site. It is emphasized that the risk of surgery must be weighed against the varying risk of the development of complications at each particular site. Polyps can almost always be treated by local excision, and radical surgery is indicated only if malignant degeneration is proven by frozen section.

2552 EXPERIMENTAL AND CLINICAL RESULTS OF INTESTINAL ANASTOMOSIS USING A SINGLE ROW OF SUTURES. *(Ger.)*

Reichel, K. *Langenbeck Arch Klin Chir* 322(Kongressber.):1005-1011, 1968.

The bursting strength of single- and double-layered gastrointestinal anastomoses was tested in dwarf pigs and dogs, operated on from 4 hr to 14 days before, by determining the inflation pressure at which air leakage occurred and then examining the mucosa histologically. These results showed that the single-layer suture, which is a slight modification of Lembert's technique (1826), was definitely superior, with almost complete mucosal regeneration within 3 days, less ulceration and less protrusion into the lumen. Only 4 hr after surgery, the single-layer sutures were able to withstand air pressures of up to 140-160 mm Hg, and by 14 days the bursting strength was equal to that of uninjured intestine. Healing after placement of double-layered sutures was less rapid. As a result, the clinical value of single- and double-layered sutures for gastrointestinal, intestinointestinal and esophagogastric anastomoses was studied in a series of cases operated on in 1966-67. Among 312 patients given single-layer sutures following gastroenterostomy, 2.24% developed suture insufficiency and 1.92% died, compared to 3.58% and 2.91%, resp. of 447 patients given double-layered sutures. There were also 3 cases of stenosis and 6 of hemorrhage in the 2nd group, compared to only a single case of bleeding in the single-layer group. The modified single-layer technique is concluded to be simpler, more rapid, and associated with a lower risk of stenosis, and is definitely preferable for gastroenterostomy or anastomoses between the small and large intestines. For esophagogastrostomy, however, the double-layer technique seems to be preferable.

2553 A STUDY OF THE GASTRO-SECRETAGOGUE POWER OF URINE (P.S.U.) BEFORE AND AFTER PORTACAVAL SHUNTING IN MAN. *(E.)*

Bader, J. P. (Bichat Hosp., Paris, France), M. Dubrasquet, S. Bonfils, P. Bernades, M. Lewin and A. Lambing. *Scand J Gastroent* 4(1):65-73, 1969.

The gastric secretagogue effect of urine from 20 patients who had been operated on with portacaval anastomosis for hepatic cirrhosis was examined before and after operation. Before operation, the urine from 4 subjects had a secretagogue effect, whereas after operation 19 patients produced urine which increased the gastric secretion in the rat. The test was significantly different in the same group of patients before and after portacaval anastomosis ($p < 0.0001$), and also when the group of postoperative patients was compared to a group of 30 control cirrhotic patients ($p < 0.001$). It is noted that the substance responsible for this urinary secretagogue power, appearing after portacaval anastomosis, is not histamine. Preliminary results seemed to suggest that this substance is similar to that obtained in the Zollinger-Ellison syndrome.

2554 **INHIBITION OF CHOLERA TOXIN ACTION IN THE RABBIT BY CYCLOHEXIMIDE.** *(E.)* Serebro, H. A. (Johns Hopkins U. Sch. Med., Baltimore, Md.), F. L. Iber, J. H. Yardley and T. R. Hendrix. *Gastroenterology* 56(3):506-511, 1969.

Pretreatment of rabbits with cycloheximide (20 mg/kg, i.v.), a potent inhibitor of protein synthesis, prevented cholera exotoxin-induced fluid production by *in vivo* jejunal loops. Glucose absorption was unaffected and the chief histological alteration in the epithelium was decreased mitotic figures in the crypts. At higher doses (40 mg/kg, i.v.), greater histological damage was seen in the crypts and fluid production was prevented, but glucose absorption was also impaired. One interpretation of these data is that cholera exotoxin induces synthesis of a protein mediator of fluid secretion and that this secretion originates in the crypts of Lieberkühn.

2555 **THE LIVER, SPLEEN AND PANCREAS IN NONPENETRATING ABDOMINAL TRAUMA.** *(Turk.)* Cilingiroglu, K. (Med. Fac., U. Istanbul, Turkey), R. Arat, Y. Göksen and M. Ünal. *Turk Tip Cem Mec* 34(10):657-664, 1968.

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2560 **TREATMENT OF CHRONIC DIARRHEA IN THE INFANT.** *(Fr.)* Ghisolfi, J. (Pediat. Med. Clin., Toulouse, France), P. Rochiccioli and A. Dalous. *Rev Med Toulouse* 4(9):1061-1069, 1968.

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2588 STRANGULATED OBTURATOR HERNIA PRESENTING AS SUBCUTANEOUS EMPHYSEMA OF THE THIGH: [CASE REPORT]. *(E.)* Kapur, B. M. L. (All-India Inst. Med. Sci., New Delhi, India) and D. K. Shah. *Canad J Surg* 12(2):233-235, 1969.

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2608 **CURRENT STATE OF ENTEROBIASIS IN CHILDREN HOSPITALIZED IN GUAYAQUIL, ECUADOR.** *(Sp.)* Sâlmon Castro, R. A. (Natl. Inst. Hyg., Guayaquil, Ecuador). *Rev Ecuat Hig* 25(2):151-154, 1968.

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2614 **THE ARTERIOGRAPHIC DIAGNOSIS AND SURGICAL TREATMENT OF AN ULCEROGENIC PANCREATIC TUMOR. (ZOLLINGER-ELLISON SYNDROME). [CASE REPORT]** *(Ger.)* Otto, H. (Surg. Clin., Saarland U., Homburg/Saar, Germany), H. Reschke and K. Ewe. *Deutsch Med Wschr* 94(10):486-488, 1969.

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2617 **RESULTS OF TREATMENT OF ACUTE INFANTILE DIARRHEA AND ITS COMPLICATIONS IN THE PAST 17 YEARS.** *(Cz.)* Valík, A. (Fac. Gen. Med., Charles U., Prague, Czechoslovakia), M. Bejblíková and D. Havlíková. *Cesk Pediat* 23(10):860-872, 1968.

See also 1858

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NOTE

Journal names are abbreviated according to the list of abbreviations used by *Index Medicus*. For journals not covered by *Index Medicus*, the abbreviations (with some modifications) found in *World Medical Periodicals*, 3rd Edition, are used.

LANGUAGE ABBREVIATIONS

Afr.	Afrikaans
Ar.	Arabic
Bul.	Bulgarian
Ch.	Chinese
Cz.	Czech
Dan.	Danish
Dut.	Dutch
E.	English
Eston.	Estonian
Fin.	Finnish
Fl.	Flemish
Fr.	French
Ger.	German
Gr.	Greek
Heb.	Hebrew
Hun.	Hungarian
Ic.	Icelandic
In.	Indonesian
It.	Italian
Jap.	Japanese
Kor.	Korean
Latv.	Latvian
Lith.	Lithuanian
Nor.	Norwegian
Pol.	Polish
Por.	Portuguese
Rum.	Rumanian
Rus.	Russian
Ser.	Serbo-Croatian
Sl.	Slovak
Sp.	Spanish
Sw.	Swedish
Th.	Thai
Turk.	Turkish
Uk.	Ukrainian
Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone
ADP	adenosine diphosphate
AMP	adenosine monophosphate
ATP	adenosine triphosphate
BSP	sulfobromophthalein
C	degrees centigrade
cm	centimeter(s)
CNS	central nervous system
cpm	counts per minute
DNA	deoxyribonucleic acid
e.g.	for example
g	gram(s)
μg	microgram(s)
hr	hour(s)
i.m.	intramuscular
i.p.	intraperitoneal
IU	international unit(s)
i.v.	intravenous
kg	kilogram(s)
LD50	median lethal dose(s)
LDH	lactic acid dehydrogenase
m	meter(s)
M	molar
mEq	milliequivalent(s)
mM	millimolar
μM	micromolar
mC, μC	milli-, microcurie(s)
mg	milligram(s)
min	minute(s)
ml	milliliter(s)
mm	millimeter(s)
MTD	maximum tolerated dose
ng	nanogram (10-9)
pg	picogram (10-12)
p.o.	orally
ppm	parts per million
r	Roentgen
RBC	red blood cells (erythrocytes), red blood count
resp.	respectively
Rev.	review (only in citations)
RNA	ribonucleic acid
s.c.	subcutaneous
sec	second(s)
SGOT	serum glutamic-oxalacetic transaminase
SGPT	serum glutamic-pyruvic transaminase
U	unit(s)
UV	ultraviolet
WBC	white blood cells (leukocytes), white blood count
yr	year(s)

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

2618 **PROTOCOLLAGEN PROLINE HYDROXYLASE IN NORMAL LIVER AND IN HEPATIC FIBROSIS.** *(E.)* Takuechi, T. (Philadelphia Gen. Hosp., Pa.) and D. J. Prockop. *Gastroenterology* 56(4):744-750, 1969.

Significant levels of protocollagen proline hydroxylase activity were demonstrated both in normal rat liver and in a single specimen of human liver. The enzymatic activity in rat and human liver was similar to protocollagen proline hydroxylase isolated from chick embryos in that it was inhibited by poly-L-proline II, and it required ascorbate, α-ketoglutarate, and ferrous iron. When hepatic fibrosis was produced in rats with carbon tetrachloride or with a choline-deficient diet, liver levels of protocollagen proline hydroxylase increased over 4-fold. In all of the experiments the increase in protocollagen proline hydroxylase activity occurred more promptly and it was more marked than the increase in collagen hydroxyproline.

2619 **FURTHER STUDIES REGARDING THE QUESTION OF CELLULAR IMMUNITY IN MOUSE THYROID.** *(E.)* Rowley, D. (Dept. Microbiol., U. Adelaide, Australia) and C. R. Jenkin. *Aust J Exp Biol Med Sci* 46(4):447-463, 1968.

Two strains of *Salmonella enteritidis* and *typhimurium*, 1 strain of paratyphi, a strain of *L. monocytogenes*, and dried BCG were administered to male and female Swiss-Webster mice (18 to 20 g body weight) in living-attenuated and in killed-vaccine forms. *In vivo* and *in vitro* bacterial killing were used to study antibody and cellular responses to infection. Killed vaccines of virulent strains of *Salmonella* were more protective than killed vaccines of avirulent strains. Macrophage bactericidal activity was increased by live-attenuated vaccines but was unaffected by killed vaccines. Both killed and attenuated forms induced antibody formation. Increased phagocytic activity by macrophages was stimulated by unrelated bacteria and required some antibody to be effective.

2620 **CELLULAR UNCOUPLING IN CANCEROUS STOMACH EPITHELIUM.** *(E.)* Kanno, Y. (Hiroshima U., Japan) and Y. Matsui. *Nature* 218(5142):775-776, 1968.

Normal and cancerous human stomach segments were isolated in Krebs solution. There was no detectable ionic communication between the cancerous epithelium and the cell input resistances were substantially higher than in normal epithelium. The membrane potentials at zero current were significantly lower than in normal epithelia. All measurements were made 1½ hr after the normal blood supply had been interrupted.

2621 **FUNCTIONAL AND MORPHOLOGICAL EFFECTS OF COELIAC AXIS COMPRESSION ON THE AFFECTED ORGANS. AN EXPERIMENTAL STUDY.** *(E.)* Koikkalainen, K. (U. Cent. Hosp., Helsinki, Finland), P. T. Harjola, E. Laustela and L. Teppo. *Ann Chir Gynaec Fenn* 57(2):239-243, 1968.

Ten of 12 mongrel dogs, average weight 15 kg, had Ameroid constrictors (inner lumen 2.7 mm) placed about the root of the celiac axis at laparotomy, leaving the other 2 animals as sham operation controls. Four to 10 days after the first procedure, transfemoral aortography was performed and the dogs reoperated to obtain pre- and postconstriction pressures and specimens of liver, spleen, pancreas, duodenum and ventricle. Blood samples drawn before the second procedure were tested for SGOT, protein (electrophoresis), amylase, lipase, blood sugar, P + P, and platelets and found to be normal. One dog died 2 days after the first procedure with celiac thrombosis and a second animal died 2 days after the second procedure from the same cause. This animal showed massive infarction at the time of biopsy. None of the others showed ischemic changes. Two of the animals showed celiac occlusion with retrograde filling and one of these showed an aortic-celiac systolic gradient of 140 mm Hg. The lowest gradient was recorded (31 mm Hg) in a dog with 50% narrowing. Only acute, complete occlusion of the celiac artery produced massive hemorrhagic infarction in the organs in the area. Even powerful stenosis of the artery caused no functional or morphological changes if the collaterals were intact.

2622 **STUDIES ON THE TRANSMISSION OF THE AGENT OF INFECTIOUS HEPATITIS TO PATAS MONKEYS.** *(E.)* Bearcroft, W. G. C. (West African Council Med. Res., Yaba, Lagos, Nigeria). *J Med Microbiol* 1(1):1-21, 1968.

Adult patas monkeys received p.o. or i.p. suspensions of liver obtained from normal humans and monkeys, humans with varying liver pathology, humans with fulminant infectious hepatitis and monkeys infected with hepatitis. Few animals became ill and very few died. The most frequently observed signs of the infectious hepatitis were neutropenia and liver damage. The disease increased in severity on passage. The onset of neutropenia was rapid after inoculation p.o. of infected liver and slower after inoculation i.p. The liver lesions were variable in severity and usually consisted of small foci of parenchyma and Kupffer cells with increased nucleolar and cytoplasmic basophilia. Liver function studies were usually normal. Electron microscopy of affected livers revealed irregularity of the nuclear membrane, increased numbers of mitochondria, hypertrophy of the Golgi apparatus and internal structures within the lysosomes. No viral particles were seen. The infective agent passed through bacteria-stopping filters and was heat and cold stable. It was not isolated in artificial media or tissue cultures and did not cause clinical disease in any other laboratory animals.

2623 **LIPID COMPOSITION OF THE BRUSH BORDERS OF RAT INTESTINAL EPITHELIAL CELLS.** *(E.)* Millington, P. F. (Med. Sch., Bristol, England) and D. R. Critchley. *Life Sci* 7(15):839-845, 1968.

Brush border fractions of rat intestinal mucosa were obtained by scraping and then subjected to electron microscopy and thin-layer and column chromatography to rule out contamination and to identify the lipid composition of the tissue. There was little or no contamination. Phospholipids and cholesterol were the major components along with free fatty acids. Triglycerides along with mono- and diglycerides were found. Cholesterol esters were absent. The phospholipid:cholesterol ratio was 3.53 in the mucosa and 1.42 to 1.6 in the brush border. The major lipids present were, in decreasing concentrations: phosphatidyl ethanolamine (40%), phosphatidyl choline (30%), the combined phosphatidyl insitol and phosphatidyl serine (20%), sphingomyelin (5%) and lysolecithin. Difficulty was experienced in the lipid extraction procedures.

2624 IMMUNOELECTROPHORESIS OF HUMAN LIVER PROTEINS. *(E.)*

Santamaria, P. (Dept. Microbiol., U. Navarra, Pamplona, Spain), A. Chordi and E. Ortiz de Lanzaduri. *Path Europ* 2(4):427-436, 1967.

Liver, kidney, lung, spleen, and prostate antigens were obtained from human organs collected after autopsies performed within 10 after death. Acetone-desiccated powder prepared from the organ tissue was used in electrophoresis. Forty antigenic components were revealed in the human liver: 8 were common with human serum, 20 with other organs (kidney, lung, spleen, brain, and prostate), and 12 existed only in the liver. The 40 components were grouped in 10 electrophoretic zones: 7 were human serum zones and 3 were new. A mitochondrial preparation of human hepatic tissue with anti-liver immunoserum absorbed with normal human serum also was subjected to immunoelectrophoresis. This revealed that 8 of the components found in the human liver were present in liver mitochondria. The chemical nature and the sedimentation coefficient of some of these components are given.

2625 THE SECRETION OF GASTRIC CANCER CELLS. *(E.)*

Kondo, K. (Ctr. Adult Dis., Osaka, Japan), H. Taniguchi and K. Takemura. *Ann Rpt Center Adult Dis* 7(1):36-45, 1967.

Cancer tissues were obtained from patients with gastric cancer and immediately fixed, buffered, dehydrated, and embedded in epoxy resin. Staining was with uranyl acetate and lead citrate. Electron microscopy was with a JEM 6C electron microscope. For light microscopy serial sections were made from the same block of specimen used for electron microscopy. Thickness of the sections was 2 μ. Three types of cancer cells containing large amounts of mucus were classified: the intracellular microcyst containing mucus; a type resembling goblet cells; and the 3rd with mucous degeneration of cytoplasm. Thirteen plates illustrate these findings.

2626 THE LIPID COMPOSITION OF THE MICROSOMAL FRACTION IN NORMAL LIVER AND IN HEPATOMA. *(Ger.)*

Theise, H. (Inst. Cell Physiol., German Acad. Sci., Berlin, Germany) and H. Bielka. *Arch Geschwulstforsch* 32(1/2):11-19, 1968.

The lipid composition of microsomal fractions was determined in the livers from female Wistar rats (150-200 g) and in transplantable hepatomas induced by feeding diethylnitrosamine. The lipid composition was found to be qualitatively similar, but quantitatively very different. Hepatoma microsomes showed a smaller proportion of phosphatides (66.5%) than normal liver microsomes (81.5%); more phosphorus-free lipids (33.5% versus 18.5%); a higher content of cholesterol (8.5% versus 4.5%). The difference in the composition of phosphatides was significantly different: hepatoma microsomes contained more animophosphatides (42.3% versus 28.0%) than normal liver microsomes; more plasmalogens (8.1% versus 3.0%); but less choline-containing phosphatides (52.2% versus 60.2%) and phosphatidylinositol + acid phosphatide (5.5% versus 11.8%). Some minor and unidentified fractions present in the hepatoma microsomes were not found in normal liver microsomes. Gas chromatography of the fatty acids in the phosphatide fractions showed greater amounts in the hepatoma microsomes, especially of the 18:1, 18:2, 20:4 and 22:6 types. The higher content of phosphotidylethanolamine in the hepatoma microsomes (29.3 versus 23.2) may be ascribed to damage of the enzyme system which changes phosphatidylethanolamine to phosphatidylcholine; the enzyme activity for this change in tumor cells is less than 10% of that found in normal tissue.

2627 SMALL BOWEL MORPHOLOGY IN CHILDHOOD. *(E.)*

Walker-Smith, J. A. (Royal Alexandra Hosp. Child., Sydney, Australia). *Med J Aust* 1(8):382-387, 1969.

As part of the diagnostic investigation of children with malabsorption, chronic diarrhea and failure to thrive, 165 consecutive proximal small intestine biopsies were taken. A flat mucosa was found in 37, thickened ridges in 50 and leaf-like villi in 78 cases. The appearance of the proximal jejunum and the distal ileum at autopsy in 21 cases (12 who had died from gastroenterological and 9 from nongastroenterological disease) showed that short, thick ridges were seen only in patients with gastroenterologic disease, that finger-like villi were most often seen in the ileum of patients who had had nongastroenterologic disease, and tongues in the bowel were seen in those who had had gastroenterologic disease.

2628 GASTRIC EOSINOPHILIA IN RATS IMMUNIZED WITH STOMACH. *(E.)*

Yee, R. D. (Massachusetts Gen. Hosp., Boston), B. G. Arnason and P. M. Dreyfus. *Proc Soc Exp Biol Med* 131(2):498-500, 1969.

Lewis and Sprague-Dawley rats received 0.1 ml of an antigen-adjuvant mixture from gastric serosa of rats or Hartley guinea pigs or the adjuvant alone. Animals were sacrificed 7, 10, 14, 21, 28, 35, or 40 days after immunization and the stomach, duodenum, ileum, ascending colon, lung, liver and spleen taken and fixed in formalin. Tissue eosinophilia was arbitrarily scored as 0 (few), + (moderate), or ++ (many). All sections were read blind. All groups remained healthy and gained weight throughout. Seven days after immunization there was no increase in eosinophilia in the stomach over that found in normal rats. At 10 days, and thereafter, most stomach-immunized rats showed increased eosinophilia throughout the tissues of the stomach wall. This was most apparent in the submucosa and occurred whether the rats had been given isologous (Lewis), homologous (Sprague-Dawley) or heterologous (guinea pig) stomach. Liver-immunized controls showed no such response. The difference was significant at the 1% level. In a small number of animals studied after 28 days, increased eosinophilia was no longer found. No eosinophilia was found in the liver, spleen or lung at any time. The production of auto-antibodies directed against organ-specific antigens in the stomach extracts and interaction of these antibodies with organ-specific antigen in the stomach may be responsible for the stomach eosinophilia.

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

2629 **DIPHASIC DISAPPEARANCE OF METACHROMASIA IN THE RAT GASTRIC MUCOSAL MAST CELLS AFTER A SINGLE INJECTION OF INSULIN.** *(E.)* Rasanen, T. (Dept. Pathol., U. Helsinki, Finland), *Scand J Gastroent* 4(2):133-136, 1969.

Nonfasted Sprague-Dawley rats weighing 260-384 g were injected with diluted insulin, 1 U each, and the changes in the metachromasia of the mast cells in their gastric mucosa observed for 35 min to 5 hr after the injection. The metachromasia decreased up to 2.5 hr, increased during the next 3-4 hr, and began to decrease 5 hr after the injection. In mucosa specimens fixed in Bouin's fluid and stained with hemalum-eosin, the mast cells of the mucosa could be distinguished by the kidney shape of the nucleus and the granules of varying size. The latter took on a light reddish stain. In the first degranulation stage no changes of the granules from normal could be seen in these specimens, but in the later stage depletion of the protoplasmic granules was observable. The mast cells of the submucosal connective tissue could not be distinguished in these specimens stained with hemalum-eosin.

2630 **NEW FINDINGS IN THE ANATOMY OF THE LIVER.** *(Ger.)* Wirbatz, W. (Inst. Cancer Res., German Acad. Sci., Berlin, Germany), J. Kiessling, G. Bauke, B. Mateev and W. Richter. *Deutsch Gesundh* 23(52):2449-2454, 1968.

2631 **LIVER SEGMENTATION.** *(Sp.)* Gimenez, R. E. (Fac. Med., Natl. U. Cordoba, Argentina). *Rev Esp Enferm Apar Dig* 27(10):1421-1426, 1968.

2632 **THE SURFACE COAT OF GASTROINTESTINAL EPITHELIAL CELLS. [EDITORIAL]** *(E.)* Trier, J. S. (Boston U. Sch. Med., Mass.). *Gastroenterology* 56(3):618-622, 1969.

2633 **THE ABDOMINAL VAGAL SYSTEM IN RATS. AN ANATOMICAL STUDY WITH EMPHASIS UPON THE DISTRIBUTION OF THE GASTRIC VAGI TO THE STOMACH.** *(E.)* Legros, G. (Dept. Surg., U. Washington Sch. Med., Seattle) and C. A. Griffith. *J Surg Res* 9(3):183-186, 1969.

2634 **A COMPARATIVE CYTOLOGIC STUDY OF THE CULTIVATION OF HEPATOMAS OF DIFFERENT GROWTH RATES.** *(E.)* Watanabe, H. (Cornell U. Med. Coll., New York, N. Y.) and E. Essner. *Cancer Res* 29(3):631-644, 1969.

2635 **LIVER 3′5′-NUCLEOTIDE PHOSPHODIESTERASE AND ITS ACTIVITY IN RAT LIVERS PERFUSED WITH INSULIN.** *(E.)* Menahan, L. A. (U. Washington Sch. Med., Seattle), K. D. Hepp and O. Wieland. *Europ J Biochem* 8(3):435-443, 1969.

2636 **ELECTRON MICROSCOPY OF THE BAT EXOCRINE PANCREAS IN HIBERNATING AND NONHIBERNATING STATES, WITH SPECIAL REFERENCE TO THE OCCURRENCE OF INTRACISTERNAL GRANULES AND CRYSTALLOIDS.** *(Jap.)* Watari, N. (Inst. Endocrinol., Gunma U., Maebashi, Japan). *Acta Anat Nippon* 43(3):152-176, 1968.

2637 **HISTOCHEMICAL AND ELECTRON MICROSCOPIC STUDIES ON THE FUNCTION AND THE FINE STRUCTURE OF HUMAN GASTRIC PARIETAL CELL.** *(Jap.)* Miyoshi, A. (Dept. Intern. Med., Kyoto U., Japan), Y. Okuda, M. Ohbayashi, S. Ohkawa, T. Miyake, M. Moriga, N. Iwai and H. Sugimoto. *Jap Arch Int Med* 15(4):103-115, 1969.

2638 **THE ARDRENERGIC INNERVATION IN THE ESOPHAGUS AND RESPIRATORY TRACT OF THE RABBIT.** *(E.)* Nishimura, T. (Nagoya City U. Med. Sch., Japan) and T. Takasu. *Otolaryngol* 67(4):444-452, 1969.

2639 **SUBFRACTIONATION OF RAT LIVER PLASMA MEMBRANES.** *(E.)* Evans, W. H. (Natl. Inst. Med. Res., London, England). *Febs Letters* 3(4):237-241, 1969.

See also: 2643,2670,2696,2993,3069,3124,3257

2640 EFFECT OF BICARBONATE ON SODIUM ABSORPTION BY THE HUMAN JEJUNUM. *(E.)* Sladen, G. E. (St. Bartholomew's Hosp., London, England) and A. M. Dawson. *Nature* 218(5138):267-268, 1968.

Continuous steady state perfusion of jejunal segments using a double-lumen tube in 15 normal adults and a triple-lumen tube in 13 was performed using various saline, bicarbonate and glucose solutions. The absorption effects of 56 mM glucose were used as a standard in demonstrating that maximum rates of sodium and water absorption occur from isotonic solutions, 56-84 mM, with respect to glucose. Bicarbonate has a significant effect on sodium and water absorption, particularly on the former in which it is comparable to the maximum effect on sodium exerted by glucose. Glucose has a more striking effect on water absorption. A similar pH for the infused solutions did not alter the effect significantly.

2641 STUDIES ON THE ACTIVITY OF SO-CALLED EXCRETORY ENZYMES IN EXPERIMENTAL OBSTRUCTIVE JAUNDICE IN RABBITS. II. SERUM ALKALINE PHOSPHATASE (AlkP), LEUCINE AMINOPEPTIDASE (LAP) AND GAMMA GLUTAMYL TRANSPEPTIDASE (GGTP) ACTIVITIES. *(E.)* Lukasik, S. (Clin. Int. Dis., Med. Acad., Wroclaw, Poland), B. Osiński and W. Lukasikowa. *Acta Med Pol* 9(1):87-93, 1968.

In 14 rabbits with obstructive jaundice induced by ligation of the common bile duct, serum activities of alkaline phosphatase (AlkP, gamma-glutamyl transpeptidase (GGTP) and leucine aminopeptidase (LAP) were determined before and at various times after surgery. The normal level of AlkP is nearly the same, and GGTP and LAP slightly higher than in humans. Following ligation AlkP and GGTP activities rose quickly and markedly while LAP remained unchanged. The maximum rise in GGTP was several times higher than that of AlkP, despite much higher levels of AlkP than GGTP in the bile of rabbits. Until cirrhosis developed, both enzyme activities decreased (AlkP more quickly), despite increasing bile retention and rising bilirubin levels. After removal of the ligatures GGTP returned to normal much more slowly than AlkP.

2642 EFFECT OF DIAZOXIDE AND CHLORTHIAZIDE ON ABSORPTION FROM THE SMALL INTESTINE *IN VIVO.* *(E.)* Gutman, Y. (Hebrew U.-Hadassah Med. Sch., Jerusalem, Israel), F. Bergmann and F. Banzekein. *Life Sci* 7(3): 189-195, 1968.

Fifty ml/kg of 0.9% NaCl containing 1% inulin was instilled through a stomach tube into groups of male albino (Hebrew U.) rats. Chlorthiazide (CTZ) or solvent was injected i.v. 5 min before saline loading and after 30 min the small intestine fluid volume and inulin concentration were assayed. Isolated 20 cm loops of cat intestine were filled with a similar saline solution containing inulin 1% and samples taken after 0, 10, 20, and 30 min for inulin concentrations. This was repeated with CTZ and diazoxide administered i.v. or dissolved in the solution. The volume of saline absorbed in the rat decreased by 14.3% after i.v. 50 mg/kg CTZ and 25.8% after 200 mg/kg. CTZ administered into the cat intestinal lumen as well as 5 times as much given i.v. inhibited sodium absorption. By itself diazoxide had no effect on absorption but diminished the inhibitory effect of CTZ. CTZ did not affect distilled water absorption from the ileum nor that of added glucose. Diazoxide did not affect glucose absorption.

2643 GASTRIC MUCOSAL ANTIBODIES AND IRON ABSORPTION. *(E.)* Murray, M. J. (Dept. Med., U. Minnesota, Minneapolis) and N. Stein. *Proc Soc Exp Biol Med* 131(2):565-568, 1969.

Studies were made of the effect of 1) antigastric mucosal antibody on iron absorption by normal rats and 4 groups of 10 rats made anemic by iron depletion, 2) antigastric mucosal antibody on the secretion of HCl by 12 male Sprague-Dawley rats in the unlikely event that depression of acid secretion would decrease iron absorption, and 3) antigastric mucosal antibody on the binding of iron by gastric juice *in vitro.* When antigastric mucosal antibody was present in rabbit serum, it significantly reduced absorption of ^{59}Fe. No significant differences in pH, volume, total acid output and acid per hr in mEq were noted in rats treated with the antibody when compared to untreated animals. *In vitro* studies showed that normal rat gastric juice slightly binds ^{59}Fe; anemic rat gastric juice has virtually no iron binding capacity; normal rabbit serum has considerable iron binding capacity, but is strikingly reduced by mixing it with either normal or anemic rat gastric juice; and antigastric mucosal serum also binds ^{59}Fe well, but this binding is not reduced by mixing with either normal or anemic gastric juices.

2644 A TRANSEPITHELIAL PUMP FOR WEAK ELECTROLYTES. *(E.)* Stevens, C. E. (New York State Vet. Coll., Ithaca), A. Dobson and J. H. Mammano. *Amer J Physiol* 216(4):983-987, 1969.

2645 EFFECT OF pH ON THE VITAMIN B$_{12}$-BINDING CAPACITY OF INTRINSIC FACTOR. *(E.)* Goldberg, L. S. (U. California Sch. Med. San Francisco) and H. H. Fudenberg. *J Lab Clin Med* 73(3):469-475, 1969.

2646 TRANSPORT IN THE LARGE INTESTINE MUCOSA WITH PARTICULAR ATTENTION TO WATER AND SOME MONOVALENT IONS. *(Dan.)* Dalmark, M. (Gentofte Hosp., Copenhagen, Denmark). *Ugeskr Laeg* 131(11):451-457, 1969.

2647 THE ECONOMY OF THE COLUMNAR EPITHELIAL CELL. *(E.)* Smyth, D. H. *Gut* 10(1):2-5, 1969.

2648 SERUM LIPID RESPONSES TO ETHYL-p-CHLOROPHENOXYISOBUTYRATE WITH DIFFERENT DIETARY FATS. *(E.)* Kokatnur, M. G. (Louisiana State U. Sch. Med., New Orleans), G. T. Malcom and R. D. Martinez. *Metabolism* 18(1):73-80, 1969.

2649 PERSORPTION OF METALLIC IRON PARTICLES. *(E.)* Volkheimer, G. (Dept. Gastroent., Humboldt U., Berlin, Germany), F. H. Schulz, A. Lindenau and U. Beitz. *Gut* 10(1):32-33, 1969.

ABSORPTION-EXCRETION

2650 **ABSORPTION AND UTILIZATION OF POLYGLUTAMYL FORMS OF FOLATE IN MAN.** *E.)* Perry, J. (M. R. C. Exp. Haematol. Res. Unit, London, England) and I. Chanarin. *Brit Med J* 4(5630):546-549, 1968.

2651 **INTESTINAL RESPONSE TO THE BODY'S REQUIREMENT FOR IRON. CONTROL OF IRON ABSORPTION.** *(E.)* Crosby, W. H. (New England Med. Ctr. Hosp., Boston, Mass.).. *JAMA* 208(2):347-351, 1969.

See also: 2815,2831

2652 EFFECT OF AMPICILLIN ON THE EXTRAHEPATIC BILE DUCTS. I. *IN VITRO* ACTIVITY ON THE COMMON BILE DUCT AND GALLBLADDER.

(It.) Arrigoni, E. (Inst. Pharmacol., U. Pavia, Italy) and G. Benzi. *Boll Soc Ital Biol Sper* 44(19):1557-1560, 1968.

Experiments with the isolated common bile ducts of 57 calves and the isolated gallbladders of 36 guinea pigs and 8 cats demonstrated that ampicillin has marked myolytic activity at concentrations normally reached during treatment of biliary tract infections. When the common bile ducts were suspended in oxygenated Tyrode's solution at 37C, ampicillin (62.5-2000 μg/ml) produced muscular relaxation and counteracted the effects of serotonin (0.10-0.20 μg/ml), histamine (0.05-0.15 μg/ml), $BaCl_2$ (3.3-4.5 μg/ml + atropine), and carbaminoylcholine (0.07-0.13 μg/ml). The effects of the last 2 agents were inhibited 70.6% and 15.6%, resp. by an ampicillin concentration of 500 μg/ml. A significant decrease in gallbladder tone and motility was also produced by ampicillin at concentrations above 125 μg/ml. The effect of cholecystokinin (0.10-0.20 μg/ml) on the isolated gallbladder was significantly counteracted by ampicillin concentrations above 31.25 μg/ml, although the depressive effect was sometimes followed by a temporary increase in contractions.

2653 THE PERISTALTIC REFLEX IN THE ISOLATED GUINEA PIG ILEUM DURING DRUG-INDUCED SPASM OF THE LONGITUDINAL MUSCLE.

(E.) Gregory, J. E. (Monash U., Clayton, Victoria, Australia) and G. A. Bentley. *Aust J Exp Biol Med Sci* 46(1):1-16, 1968.

Fresh segments of proximal guinea pig ileum were obtained from animals of both sexes weighing 400-800 g and suspended in modified Kreb's solution by their oral and aboral ends to the short arms of J-tubes. Peristalsis was initiated by injecting fluid, and intraluminal pressure monitoring of circular muscle contractions was performed after longitudinal contraction had been induced by various drugs. Lengthening of the bowel segment was always associated with circular muscle contractions, was not prevented by guanethidine, was not observed in parts of ileum adjacent to parts undergoing persistalsis, and could be produced by contracting the circular muscle in preparations blocked by procaine. When the shortening of the circular muscle was mechanically limited, the lengthening of the longitudinal muscle was decreased.

2654 THE PROPAGATION OF CONTRACTILE WAVES FROM DUODENUM TO JEJUNUM.

(E.) Rinecker, H. (Inst. Exp. Surg., U. Munich, Germany), C. Chaussy and W. Brendel. *Pflugers Arch* 305(3):210-218, 1969.

In 4 12-kg mongrel dogs, extraluminal strain-gauge transducers were sutured to the duodenum immediately distal to the pancreas and to the upper jejunum 10 cm distal to the duodenojejunal flexure. Simultaneous measurements in the unanesthetized state, using a technique which excluded bowel motility during deep inspiration, failed to demonstrate an independent pacemaker in the duodenojejunal flexure region. Jejunal rhythm was strongly coupled to that of the duodenum, apparently because of the conduction of a coordinating impulse having variable speed. It is concluded that peristaltic contraction waves run continuously from the duodenum to the upper jejunum without interruption.

2655 EFFECT OF SECRETIN AND PANCREOZYMIN ON DUODENAL MOTILITY. *(It.)*

Lanfranchi, G. A. (U. Bologna, Italy). *Minerva Gastroent* 14(4):197-204, 1968.

Duodenal motility was studied by electroduodenography, electromanometry, and roentgen-cinematography in 8 normal subjects injected i.v. with 80 U secretin, in 6 normal subjects injected i.v. with 90 U pancreozymin; and in 3 dogs injected with 1/3 these quantities of hormones. Pancreatic secretory response was evaluated by an intraduodenal pH-meter. In 5 subjects given secretin, a series of rhythmic duodenal contractions was produced after an average of 1.7 min for an average of 5.6 min. The basal electric rhythm was not modified after hormonal stimulation, but the width of the waves and the spike frequency increased. In 5 subjects given pancreozymin, after an average of 3.8 min, duodenal contractions were present for a period of 21.1 min. Also the width of the waves and spike frequency increased. Both the hormones, especially secretin, caused a variation in pH relatively independent of the motor phenomena. Results obtained in dogs confirmed these findings.

2656 EFFECTS OF INTRALUMINAL PRESSURE IN THE COLON ON ITS VASCULAR PRESSURE-FLOW RELATIONSHIPS.

(E.) Hanson, K. M. (Ohio State U. Coll. Med., Columbus) and F. T. Moore. *Proc Soc Exp Biol Med* 131(2):373-376, 1969.

The effects of distension of the colon on various vascular responses to changes in arterial or venous pressure were studied in dogs in which the colon was exposed and freed of its mesenteric attachments and whose caudal mesenteric artery was joined to the femoral artery cannula of a perfusion donor dog. As arterial perfusion was reduced some evidence of autoregulation was seen under control conditions in all 18 experiments conducted. Distension of the colon so that intraluminal pressure was held at 50 mm Hg resulted in dramatic changes in pressure-flow correlations. Evidence of autoregulation was absent in every case. Over the 100-60 mm Hg pressure range, mean changes in flow and resistance were -65 ± 4 and +77 ± 11 (SE)%, resp. Papavarine infusion resulted in increased colon blood flow and also abolished autoregulation. Elevation of venous pressure from 0 to 25 mm Hg resulted in a significant decrease in colon blood flow and increase in resistance (-44 ± 3% and +52 ± 4%, resp.). When the colon was distended to a pressure of 50 mm Hg effects of elevated venous pressure (0-25 mm Hg) on flow (13 ± 2% decrease) and resistance (14 ± 2% decrease) were not statistically significant.

2657 EFFECT OF BRADYKININ ON ISOLATED RAT INTESTINE IN ISOTONIC SODIUM CHLORIDE WITH THE ADDITION OF 7.1% TETTUCCIO WATER (RINGER-MESSINI).

(It.) Grassi, M. (Inst. System. Med. Ther. Med. Hydrol., U. Rome, Italy), F. Grossi and T. Traetta. *Epatologia* 14(1):47-54, 1968.

2658 **INTESTINAL MOTILITY.** *(E.)* Bortoff, A. (State U. New York Med. Ctr., Syracuse, N. Y.). *New Eng J Med* 280(24):1335-1337, 1969.

2659 **PHYSIOLOGY AND PHYSIOPATHOLOGY OF GASTRIC EVACUATION.** *(Fr.)* Lenz, H. (Med. U. Polyclin., Bonn, Germany), A. Hemmati and P. Ghavami. *Ann Radiol* 10(9/10):689-697, 1967.

2660 **THE RELATION BETWEEN THE INHIBITORY NEURON CONCERNED WITH THE INTRINSIC INTESTINAL REFLEXES AND VAGAL INHIBITION.** *(Jap.)* Fukuda, H. (Okayama U. Med. Sch., Japan). *J Physiol Soc Jap* 30(9):702-709, 1968.

2661 **THE INHIBITORY EFFERENT NEURON CONCERNED WITH THE INTRINSIC INTESTINAL REFLEXES.** *(Jap.)* Fukuda, H. (Okayama U. Med. Sch., Japan). *J Physiol Soc Jap* 30(9):697-701, 1968.

See also: 2760,2761,2764,2865,3014,3020

2662 *IN VITRO* **INSULINOGENIC EFFECT OF MATERIAL HARVESTED FROM INCUBATED GUT LOOPS OF RATS.** *(E.)* Haddad, J. G. Jr. (U. Virginia Med. Ctr., Charlottesville) and J. A. Owen Jr. *Metabolism* 18(1):71-72, 1969.

Inverted loops of small intestine from normal Sprague-Dawley rats were incubated for 45 min in media with 25 mg% glucose. When the serosal material from these loops was added to pieces of rat pancreas which were incubated in 60 mg% glucose for varying intervals, the assayable insulin in the medium was more than doubled; this insulinogenic effect was not due to added glucose.

2663 PRESENCE OF COMPOUNDS CONTAINING IRON IN THE DIGESTIVE SYSTEM. *(E.)* Steeves, H. R. (Dept. Biol., Virginia Polytechnical Inst., Blacksburg). *Nature* 218(5139):393-394, 1968.

The hepatopancreas and hind-gut of 12 specimens (5 to 12 inches in length) of the benthonic isopod, *Bathynomus giganteus*, were freshly fixed and stained for iron containing compounds. There were 2 types of hepatocellular cells, one of which (the I cells) demonstrated iron-containing granules that predominated in their basal, subnuclear portions. Lesser amounts of similar granules were seen in the epithelium of the hind-gut.

2664 THE EFFECT OF TWO SUCCESSIVE IRRADIATIONS ON THE CELLULAR POPULATION OF RAT LIEBERKUHN'S CRYPTS. THE INFLUENCE OF CYSTAMINE. *(Fr.)* Simar, L. J. (Lab. Path. Anat., U. Liege, Belgium). *CR Soc Biol (Paris)* 162(5-6):1233-1237, 1968.

2665 THE SIGNIFICANCE OF THE BILE-PRODUCING FUNCTION OF THE LIVER IN LIPID AND PROTEIN METABOLISM OF THE ORGANISM. *(Rus.)* Zamychkina, K. S. (Acad. Med. Sci., Moscow, USSR). *Vestn Akad Med Nauk SSSR* 23(12):20-27, 1968.

2666 THE ROLE OF THE DIGESTIVE TRACT IN THE REGULATION OF LIPID METABOLISM. *(Rus.)* Martsevich, M. S. (Acad. Med. Sci., Moscow, USSR), S. I. Filippovich, L. A. Shekun and E. D. Klimenko. *Vestn Akad Med Nauk SSSR* 23(12):11-20, 1968.

2667 EFFECTS OF METABOLIC INHIBITORS ON POTASSIUM TRANSPORT IN SUBMAXILLARY GLANDS. *(E.)* Siegel, I. A. (Dept. Pharmacol., State U. New York, Buffalo). *Amer J Physiol* 216(4):728-733, 1969.

2668 ROLE OF GASTRO-INTESTINAL FACTORS IN REACTIVE HYPOGLYCEMIA. [CASE REPORT] *(E.)* Veverbrandts, E. (Harvard Med. Sch., Boston, Mass.), W. Olsen and R. A. Arky. *Metabolism* 18(1):6-12, 1969.

See also: 3001

2669 **EXPERIMENTAL DATA ON THE EXCRETION OF ELECTROLYTES AND PEPSIN WITH THE GASTRIC JUICE.** *(Pol.)* Bugajski, J. (Dept. Pharmacol., Polish Acad. Sci., Krakow, Poland). *Postepy Hig Med Doswiad* 22(5):727-791, 1968.

The results of 202 gastric secretion studies (57 on dogs and 145 on cats) are reported which involved determinations of the electrolyte composition in 1364 samples of gastric juice and 212 samples of serum. These results indicate that short-term secretion under the influence of histamine or gastrin does not produce significant changes in the serum electrolyte levels in either dogs or cats. During insulin-stimulated secretion, however, there is a significant decrease in serum K in both cats and dogs and an increase in serum Ca in dogs. Similar results are obtained with reserpine, indicating that these 2 drugs have a similar mechanism of action. Prolonged histamine-induced hypersecretion, which leads to the development of gastric ulcers in cats, is accompanied by pronounced disturbances in the serum electrolytes: increases in K and Ca and decreases in Na and Cl. Reserpine and insulin have a similar effect on pepsin secretion, which is stronger than that of histamine or gastrin, and reserpine is the most powerful of the known agents which affect gastric chloride and acid secretion. This effect should be taken into consideration when reserpine is given for therapeutic purposes. The electrolyte composition of the gastric juice varies with the particular type of stimulus and is determined by the relative intensity of secretory activity in the various types of gastric mucosal cells. Regardless of the stimulus, the Na and Ca concentrations of the gastric juice remain inversely proportional to the HCl concentration. The pepsin concentration in the gastric juice is largely proportional to the Na and Ca levels. The relation between the K and HCl concentrations in the gastric juice indicates that K plays an important role in gastric acid secretion.

2670 **EFFECT OF PREDNISOLONE ON GASTRIC FUNCTION AND STRUCTURE IN MAN.** *(E.)* Strickland, R. G. (Stanford U. Sch. Med., Palo Alto, Calif.), J. M. Fisher and K. B. Taylor. *Gastroenterology* 56(4):675-686, 1969.

Administration of prednisolone in a dosage of 20 mg/day for 1 month caused a modest but significant increase in stimulated gastric acid secretion in a group of 14 healthy, institutionalized male subjects. In contrast, a control group not taking corticosteroids showed no significant change in stimulated acid secretion when tested on two occasions 1 month apart. The increase in stimulated acid output following prednisolone was the result of an increase in acid concentration. Stimulated secretory volume was not significantly altered by prednisolone. Gastric biopsies prior to prednisolone administration revealed chronic superficial gastritis in 5 of the 14 subjects. However, acid production in these subjects did not significantly differ from that in persons with normal gastric histology; stimulated acid concentration increased in both groups during prednisolone administration. Gastric mucosal structure in both normal and gastritic subjects was unchanged by prednisolone, and no ulcers were observed in these subjects in a prospective radiological study.

2671 **POTENTIATION OF GASTRIC ACID RESPONSE IN THE DOG.** *(E.)* Johnson, L. R. (VA Ctr., Los Angeles, Calif.) and M. I. Grossman. *Gastroenterology* 56(4):687-692, 1969.

In dogs having fistulas of the total stomach, gastric acid secretion was measured in response to continuous intravenous infusions of histamine, gastrin, and combinations of histamine and gastrin and histamine and bethanechol. The response to histamine was potentiated by 0.20 g/kg/hr of gastrin and 0.04 mg/kg/hr of bethanechol, but not by 0.05 g/kg/hr of gastrin. When potentiation occurred the slope of the line relating logarithm of dose to response was significantly steeper and the observed maximal response was much higher. The most striking finding was the near-doubling of the observed maximal outputs during potentiation, from about 10 mEq/15-min period to about 17 mEq/15-min period. Maximal acid responses were also calculated from the Lineweaver-Burk transformation of the data and found to be approximately equal when potentiation was not occurring. During potentiation, however, calculated maximal responses increased as much as 100%. It was concluded that in the dog the maximal secretory capacity depends on the nature of the stimulant or stimulants as well as on the functionally secreting mass of the stomach.

2672 **ATROPINE INHIBITION OF INSULIN-, HISTAMINE-, AND PENTAGASTRIN-STIMULATED GASTRIC ELECTROLYTE AND PEPSIN SECRETION IN THE DOG.** *(E.)* Hirschowitz, B. I. (VA Hosp., Birmingham, Ala.) and G. Sachs. *Gastroenterology* 56(4):693-702, 1969.

Atropine (80 μg/kg) was injected i.v. into 9 fistula dogs secreting in response to insulin hypoglycemia, causing immediate (100%) and prolonged (> 2½ hr) inhibition. The same dose was given 90 min after the start of a continuous infusion of either pentagastrin (1.5 μg/kg/hr) or histamine (1 mg base/hr). Histamine-stimulated volume output fell by about 30%, and pepsin output fell by 80%, but electrolyte composition was largely unchanged, whereas gastrin effects were blocked 75 to 95% and comprised a large drop in volume, as well as decreases in Cl^-, H^+, and K^+ concentrations and a rise in Na^+ concentration. Pepsin concentrations were greatly reduced in both, being higher to start with in the pentagastrin experiments. The action of atropine in inhibiting pentagastrin action emphasizes the similarities between the actions of this group of peptides and cholinergic agents.

2673 **EFFECT OF EXCLUSION, ACIDIFICATION, AND EXCISION OF THE DUODENUM ON GASTRIC ACID SECRETION AND THE PRODUCTION OF PENTAGASTRIN-INDUCED PEPTIC ULCERS IN CATS.** *(E.)* Konturek, S. J. (Med. Sch., Krakow, Poland), J. Dubiel and B. Gabrys. *Gastroenterology* 56(4):703-710, 1969.

Gastric acid secretion and peptic ulcer production induced by pentagastrin infusion were studied in two separate series of cats after the following procedures: 1) transplantation of the common biliary duct and pancreatic duct to the proximal jejunum, 2) formation of the duodenal Thiry fistula open distally for perfusion with saline or acid, 3) excision of the duodenal fistula, and 4) transplantation of the biliary and pancreatic ducts to the distal jejunum. Exclusion and subsequent excision of the duodenum were followed by an increase in basal acid secretion and in a shift to the left of the dose-response curve to pentagastrin. The maximal acid output was significantly higher only after the excision of the isolated duodenal loop. Basal achlorhydria and a decrease of the dose-response curve to pentagastrin with a shift to the right occurred after acidification of the duodenal loop. The greatest production of peptic ulcers induced by 24-hr infusion of pentagastrin in the dose of 16 μg/kg/hr was found in the group of duodenectomized animals with the biliary and pancreatic ducts transplanted to the distal jejunum. No statistically significant difference in the ulcer area was found between the group of cats with the duodenum left in the normal position and with the bile and pancreatic juices diverted to the upper jejunum, and the groups with excluded or resected duodenum, and with the alkaline juices diverted to the upper jejunum near the gastrojejunal junction. The acid perfusion of the duodenal loop completely prevented the production of peptic ulcerations. It is concluded that the inflow of bile and pancreatic juices plays an important role in the production of pentagastrin-induced peptic ulcers in cats.

2674 GASTRIN AND ITS DERIVATIVES. OUR CLINICAL USE OF SYNTHETIC HUMAN GASTRIN. *(It.)* Dalmonte, P. R. (U. Bologna, Italy), E. Fiore and R. Cremonini. *G Clin Med* 49(8):810-826, 1968.

Production of pepsin, acid juice and intrinsic factor were evaluated in 3 normal subjects and 2 ulcer patients after slow i.v. infusion (60 min) of 2 μg/kg body weight of synthetic II human gastrin, diluted in 100 cc physiologic solution. The results were compared with those after s.c. infusion of 100 mg betazole hydrochloride (Histalog), and in 3 subjects, after slow perfusion (60 min) of 6 μg/min pentagastrin. After gastrin the average volume of gastric secretion increased from a basal level of 108 ml to 304 ml after 60 min, and to 364 ml after 75 min. After Histalog, the average volume increased from 106 ml to 231 ml (60 min) and 293 ml (75 min). The quantity of hydrochloric acid increased after gastrin from 6.2 mEq to 37.74 mEq (60 min) and to 42.24 mEq (75 min); and after Histalog, from 6.20 mEq to 23.26 mEq (60 min) and 29.19 mEq (75 min). The quantity of intrinsic factor increased after gastrin, from 5209 U to 23,111 U (75 min). Pentagastrin was slightly less active than gastrin in the 3 subjects. After gastrin, pepsin production increased from 600 U/ml gastric juice to 5220/ml (60 min) and to 6320/ml (75 min); after Histalog it increased from 560/ml to 4165/ml (60 min) and to 4990/ml (75 min). No side effects were observed during or after the administration of gastrin.

2675 SELECTIVE LABELING OF HISTAMINE IN RAT GASTRIC MUCOSA: APPLICATION TO MEASUREMENT OF TURNOVER RATE. *(E.)* Beaven, M. A. (Natl. Heart Inst., NIH, Bethesda, Md.), Z. Horakova, W. B. Severs and B. B. Brodie. *J Pharmacol Exp Ther* 161(2):320-328, 1968.

Labeled histamine (250 μC/kg; i.v.) was administered to male Sprague-Dawley rats in order to measure the turnover rate of gastric histamine. Within one hr after injection, the labeled amine taken up by the stomach disappeared by an exponential decay with a half-life of about one hr. The histamine in the gastric juice had the same specific activity as that in the stomach. The turnover rate of the endogenous amine was calculated from the product of the histamine level and the rate constant for the histamine specific activity decline in the stomach. The magnitude of this value, 15-20 μg/hr/g of rat stomach, indicated that the histamine in the mucosa turned over at a rapid rate. A decrease in gastric secretion caused by atropine (10 mg/kg), or exclusion of saliva from the stomach, was accompanied by a decrease in the turnover rate of histamine. An increase in the gastric secretion produced by cholinergic stimulation was accompanied by an increase in the turnover rate of histamine. However; the changes in the turnover rate were not accompanied by changes in histamine levels, indicating that the rate of histamine synthesis was increased or decreased parallel to changes in the rate loss. These results suggest that the turnover of gastric histamine is related to the secretory activity of the gastric mucosa and that a regulatory mechanism exists for rapid adjustment of histamine synthesis to maintain constant levels of histamine.

2676 GASTRIC SECRETION OF HCl, PEPSIN AND INTRINSIC FACTOR IN MAN AFTER STIMULATION WITH SYNTHETIC HUMAN GASTRIN. *(It.)* Dal Monte, P. R. (Inst. Spec. Med. Path., U. Bologna, Italy), E. Fiore, R. Cremonini and G. De Luca. *Boll Soc Ital Biol Sper* 44(1):1617-1620, 1968.

Synthetic human gastrin II (2 μg/kg by slow i.v. infusion) was compared with betazole HCl (Histalog; 100 mg s.c.) in studies on 7 patients (20-47 yr old), 2 of whom had duodenal ulcers while 5 had apparently normal gastric function. The mean volume of gastric juice secreted in 60 min was 231 ml after Histalog and 304 ml after gastrin, while the total acid secretion in the same time period was 23.26 mEq and 34.47 mEq, resp. Synthetic gastrin also had a greater effect on pepsin secretion (5220 U/ml and 4165 U/ml, resp. after 60 min), and had a marked stimulatory effect on intrinsic factor secretion (from a basal level of 5209 to 23,111 U in 75 min). It is concluded that synthetic human gastrin is an effective stimulant of gastric secretion, producing a greater response than a maximal dose of Histalog, without side effects.

2677 RESPONSE OF THE PYLORUS AND OESOPHAGEAL LIGATED RAT TO GASTRIN AND A RELATED PEPTIDE. *(E.)* Hansky, J. (Monash U., Melbourne, Australia). *Aust J Exp Biol Med Sci* 46(4):473-478, 1968.

Fasting male and female Wistar rats (90 to 190 g in weight) were subjected to pyloric and esophageal ligations adjacent to their stomachs which preserved both vessels and vagi. Gastrin (5-40 μg), pentagastrin (25-200 μg), and insulin (2 U) were injected s.c. in varying regimens at the time of the procedure. The 3-hr gastric acid levels were increased above basal controls by 5 μg gastrin and 25 μg pentagastrin, and maximal secretion was obtained by 20 and 100 μg resp. Supramaximal doses inhibited acid secretion.

2678 RELATIONS BETWEEN THE CHEMICAL STRUCTURE OF A NEW DERIVATIVE OF A DICARBOXYLIC AMINO ACID (XYLAMIDE) AND ITS ANTIGASTRIN ACTIVITY IN THE RAT. *(It.)* Rovati, A. L.

(Rotta Res. Labs., Milan, Italy). *Minerva Med* 60(23):1011-1016, 1969.

In experiments on 60 Sprague-Dawley rats, the effects of xylamide (N-benzoyl-N′,N′-di-n.-propylisoglutamide; 500 mg/kg) and benzoylglutamic acid (375 mg/kg) were compared against gastric acid secretion stimulated by gastrin (25 μg/kg/hr) and/or histamine (5 mg/kg/hr). Whereas both xylamide and benzoylglutamic acid were effective against histamine-stimulated secretion, and neither were effective against secretion stimulated by a combination of gastrin and histamine, only xylamide was effective against gastrin-stimulated secretion. It thus appears that xylamide has specific anti-gastrin activity which is furnished by the transformation of one of the carboxyl groups of benzoylglutamic acid into an amide group. It is noteworthy that gastrin activity also appears only when the carboxyl group of the terminal amino acid (phenylalanine) is converted to an amide. The LD_{50} in mice, antisecretory activity in rats, and mudriatic activity in mice are tabulated for 16 dicarboxylic acid derivatives based on data in the literature.

2679 **COMPARATIVE STUDIES ON THE EFFECT OF PENTAGASTRIN AND HISTAMINE ON MAXIMAL GASTRIC SECRETION.** *(Pol.)* Mlodzki, M. (Gastroent. Clin., SDL, Acad. Med. Warsaw, Poland). *Pol Arch Med Wewnet* 42(4):649-654, 1969.

In 37 patients (14 men and 23 women, 19-63 yr old) with various gastrointestinal diseases, the secretory response to histamine (0.024 mg/kg) was compared with that to pentagastrin (0.006 mg/kg) given 2-26 days later. The average basal secretion before the 2 stimuli did not differ significantly (2.9-3.1 mEq/hr) and showed a good correlation (r = 0.92) between the 2 series. The maximal gastric secretion was 16.3 ± 13.3 mEq/hr after histamine and 17.3 ± 12.1 mEq/hr after pentagastrin, which again was not significantly different. There was again an excellent correlation (r = 0.93) between the 2 series. However, while pentagastrin produced only negligible side effects in a few cases, this dose of histamine produced severe side effects in almost all cases. Pentagastrin is concluded to be the best stimulant for tests of gastric secretion in view of its histamine-like effectiveness combined with a virtual absence of significant side effects.

2680 **REVERSED JEJUNAL SEGMENTS AND GASTRIC HYPERSECRETION.** *(E.)* Kimura, S. (VA Hosp., Des Moines, Iowa) and L. R. Dragstedt II. *Arch Surg (Chicago)* 98(6):713-715, 1969.

Ten female mongrel dogs (10-15 kg) had denervated Heidenhain stomach pouches constructed which were drained externally by cannulae. After 38 control 24-hr secretion collections were obtained, 15 cm reversed jejunum segments were made on 6 dogs and 8 cm reversed segments in 4 dogs. Seven similar animals had distal-75%-small-intestinal resection along with the construction of Heidenhain pouches. Following baseline 24-hr sampling of gastric secretions, the same reversal of segments was made. In the first group gastric emptying time was more increased with the reversal of the shorter length (65% vs 45%) while the longer reversal showed a greater increase in pouch secretion (67% vs 44%). In the second group the emptying time was greater after the shorter reversal (44% vs 38%) and there was also more secretion with the reversal of the shorter segment (63% vs 61%). It may be useful to reverse 8- to 10-cm jejunal segments in treating the dumping syndrome, the short bowel syndrome, and postvagotomy diarrhea.

2681 **AN ENDOSCOPIC METHOD TO INVESTIGATE THE GASTRIC ACID SECRETION.** *(E.)* Okuda, S. (Ctr. Adult Dis., Osaka, Japan), T. Saegusa, T. Ito, H. Inui and N. Senda. *Ann Rpt Center Adult Dis* 7(1):46-52, 1967.

A method for endoscopic observation of the gastric mucosa during stimulation of gastric acid secretion is described. The stomach is washed out with a Levine tube with about 400 ml lukewarm 5% sodium bicarbonate solution and 20-30 ml 0.3% Congo Red solution introduced. By changing the body position and manipulation of the abdomen the dye can be applied to the relevant portion of the gastric wall. A Gastrofibercamera or Gastrofiberscope is inserted followed by s.c. administration of 2 mg/kg histalog. The endoscopic examination is continued for 20-30 min after stimulation until a clearly distinguishable stable bluish-black zone associated with gastric acid secretion can be observed. In tests with 50 human subjects: gastritis (8), chronic ulcers (22), gastric polyp (2), gastric cancer (14), and without gastrointestinal pathology (8), the secretion began 2-15 min after stimulation in 43 subjects. Bluish-black spots appeared and gradually enlarged and fused to become a stable acid secretion area after 20-30 min. The zone remained stable even during 10 min observation. No difference in the time of onset of acid secretion was observed with Histalog (2 mg/kg) given in 25 and histamine (0.04 mg/kg) given in 15 cases. The test was reproducible as indicated by identical results observed in 2 cases studied again after 1 and 3 months, resp. Studies were also carried out in dogs. Histological findings are reported in dogs and human subjects.

2682 **CHROMATOGRAPHIC ANALYSIS OF FREE AMINO ACIDS OF GASTRIC JUICE IN PATIENTS WITH CANCER AND OTHER STOMACH DISEASES.** *(E.)* Abasov, I. T. (Azerbaijan Inst. Radiol. Oncol., Baku, USSR). *Neoplasma (Bratisl)* 14(4):429-434, 1967.

Chromatographic studies were made of the free amino acids in the gastric juice of 240 persons: 25 normal controls, 48 patients with chronic gastritis, 55 with gastric and duodenal ulcers, 12 with gastric polyposis, and 100 with cancer of the stomach. A second study was made of 20 patients after resection of the stomach. One-dimensional ascending chromatography and a semi-quantitative method were employed. In normal subjects and patients with chronic gastritis, gastric polyposis, and ulcers, the frequency and occurence and color-intensity of amino acid spots were nearly identical: an average of 10.6-11.0 spots were detected on the chromatogram and intense spots were rare. In stomach cancer patients the number of spots averaged 13.4 and intense spots occurred frequently: especially those for leucine, alanine, valine and lysine. More than half the patients with stomach cancer had a cystine (with cysteine) spot while in other subjects cystine was found 2-3 times less frequently. In cancer patients the leucine and alanine content of gastric juice is more than double that in patients with other gastric diseases. After stomach resection, amino acids secreted by the stomach stump decreased to near normal values. A totally different picture was observed in 3 patients with recurrent tumor. The determination of amino acids in gastric juice may be useful in differential diagnosis.

2683 COMPARISON OF THE GASTRIC SECRETORY RESPONSES TO PENTAGASTRIN AND TO INSULIN. *(E.)* Payne, R. A. (Royal Postgrad. Med. Sch., London England) and A. G. Cox. *Gastroenterology* 56(5):882-886, 1969.

Gastric acid secretion in response to pentagastrin (6 μg/kg/hr for 2 hr i.v.) and insulin-induced hypoglycemia (0.25 U/kg i.v.) was compared in 24 patients admitted with dyspeptic symptoms; the response to maximal histamine (40 μg/kg/hr) stimulation was also determined in 10 patients. The mean output (40.4 mEq) after pentagastrin was significantly higher than the mean output (29.6 mEq) after insulin. In only 1 patient was the response to insulin higher than that to pentagastrin. There was a highly significant correlation between the responses to pentagastrin and insulin hypoglycemia. Both the volumes of gastric secretions and their concentrations were greater after pentagastrin than after insulin. In the standard histamine infusion test, the response to insulin was lower than the response to the other 2 stimuli. Insulin did not inhibit gastric secretion.

2684 SUSTAINED INHIBITION OF GASTRIC SECRETION BY REPEATED RAPID INTRAVENOUS INJECTIONS OF GASTRIN. *(E.)* Master, S. P. (Western Infirm., Glasgow, Scotland), B. S. Bedi, A. P. deSousa and I. E. Gillespie. *Gastroenterology* 56(5):875-881, 1969.

A single rapid i.v. injection of 10 μg of pentagastrin was given to 4 Heidenhain pouch dogs after a plateau of acid response to continuous i.v. histamine infusion had been obtained. The pentagastrin injection was repeated twice after the acid responses had returned to within 15% of the original plateau. The degree and duration of the inhibition were the same after all 3 injections, with results identical in all dogs. The inhibition was reproducible with no evidence of escape following successive injections. In a second group of experiments to determine the possibility of achieving continuous prolonged suppression of the histamine response by a series of spaced injections, further injections of pentagastrin were given as soon as the inhibiting effects of the previous one began to wear off. There was no evidence of diminution in the degree or duration of the inhibition. Sustained inhibition of the pouch responses to either the continuous i.v. infusion of histamine or to a meat meal were achieved in the series of spaced pentagastrin injections, without observable side effects.

2685 THE BLOOD SUPPLY OF THE STOMACH. *(E.)* Jacobson, E. D. (U. Oklahoma Med. Ctr., Oklahoma City). *Surg Clin N Amer* 49(3):559-564, 1969.

2686 GASTROIONOGRAM. A NEW METHOD OF APPROACHING THE STUDY OF INORGANIC ELEMENTS OF GASTRIC JUICE. *(Sp.)* Meeroff, J. C. (Gregorio A. Alfaro Polyclin., Buenos Aires, Argentina), J. A. Rofrano and M. Meeroff. *Rev Esp Enferm Apar Dig* 28(2): 181-190, 1969.

2687 REVERSAL BY POTASSIUM OF AN EFFECT OF BARIUM ON THE FROG GASTRIC MUCOSA. *(E.)* Pacifico, A. D. (U. Alabama Med. Ctr., Birmingham), M. Schwartz, T. N. MacKrell, S. G. Spangler, S. S. Sanders and W. S. Rehm. *Amer J Physiol* 216(3):536-541, 1969.

2688 ELECTROPHYSIOLOGICAL EFFECTS OF METHOXYFLURANE (PENTHRANE) ON FROG GASTRIC MUCOSA. *(E.)* MacKrell, T. N. (U. Louisville, Dept. Anesthesiol. Engin. Phys., Ky.) and M. Schwartz. *Amer J Physiol* 216(3):572-576, 1969.

2689 THE IRON-BINDING PROPERTIES OF GASTRIC JUICE. *(E.)* Jacobs, A. (Welsh Natl. Sch. Med., Cardiff, Wales). *Clin Chim Acta* 24(1):87-92, 1969.

2690 EFFECTS OF GASTRIN AND ITS DERIVATIVES IN MAN. *(E.)* Makhlouf, G. M. (U. Alabama Med. Ctr., Birmingham). *Fed Proc* 27(6):1322-1327, 1968.

See also: 2629,2780,2803,2817,2818,2964,3015,3023

Pancreas

2691 **DESOXYRIBONUCLEASE IN DIAGNOSIS OF EXOCRINE PANCREAS DISEASES: EXPERIMENTAL STUDY.** *(It.)* Santambrogio, C. (Inst. Gen. Clin. Med., U. Milan, Italy), S. Negri, L. Tenconi, F. Civardi and N. Massari. *Biol Lat* 21(1):73-79, 1968.

n male rats acute and chronic pancreatitis was induced by ethionine intoxication. Lesions caused by pure ductal stasis and by ductal stasis associated with cholestasis were induced by tying the pancreatic ducts or biliary ducts. Desoxyribonuclease I level was determined in pancreatic juice and serum by a turbidimetric method. The enzyme level in serum of rats injected with 2 U/kg pancreozymin decreased 17% in acute pancreatitis and 1.9% in chronic pancreatitis. In stasis conditions it increased 20%. The average values in pancreatic juice after hormonal stimulation decreased 40% in acute pancreatitis, and 3% in chronic pancreatitis. The assay for this enzyme, especially at the serum level, is useful in the functional diagnosis of the exocrine pancreas.

2692 **SERUM TRYPTIC-LIKE ACTIVITY IN DIAGNOSIS OF EXOCRINE PANCREAS DISEASES: EXPERIMENTAL STUDY.** *(It.)* Tenconi, L. (Inst. Clin. Med., U. Milan, Italy), C. Santambrogio, F. Civardi, S. Procaccia and N. Massari. *Biol Lat* 21(1):82-87, 1968.

A study was carried out on normal male rats, in rats with induced acute and chronic pancreatitis (by ethionine intoxication), in rats with lesions caused by pure ductal stasis, and with lesions by ductal stasis associated with cholestasis. Trypsin level in serum and in pancreatic juice was determined by a method based on benzoyl-arginine-betanaphthylamide hydrolysis. The average values of enzyme activity in serum, after hormonal stimulation with pancreozymin (2 U/kg) increased 75% in controls; decreased 21% in acute pancreatitis; no modification in chronic pancreatitis; and increased more than 50% in stasis conditions. In pancreatic juice, the enzyme activity after hormonal stimulation, increased 88% in controls, 113% in acute pancreatitis and 38% in chronic conditions. Serum assay of trypsin activity is useful in the diagnosis of exocrine pancreas malfunction.

2693 **AN "ISOLATED FUNCTIONAL SEGMENT" PANCREATIC FISTULA IN THE DOG.** *(E.)* Sherman, F. C. (Yale U. Sch. Med., New Haven, Conn.) and W. W. Lindenmuth. *J Surg Res* 9(3):113-117, 1969.

See also: 2837

2694 **EFFECT OF HYPOKALEMIA ON THE REDUCTIVE AMINATION OF α-KETOGLUTARATE BY MITOCHONDRIA FROM NORMAL AND CIRRHOTIC RAT LIVER.** *(E.)* Gumucio, J. J. (U. Michigan Med. Sch., Ann Arbor), E. G. Laughrey and K. S. Henley. *Gastroenterolog* 56(4):737-743, 1969.

The reductive amination of α-ketoglutarate by glutamic dehydrogenase with malate as the hydrogen donor has been studied under anaerobic conditions, with added ATP, in normal and cirrhotic rat liver mitochondria isolated from normokalemic and hypokalemic animals. The formation of glutamate and aspartate was measured as an index of the amount of ammonia incorporated. There was no difference in the amount of ammonia incorporated by normal and cirrhotic rat liver mitochondria. Hypokalemia lowered the ability of liver mitochondria to incorporate ammonia by the reductive amination of α-ketoglutarate in normal animals, and more strikingly in cirrhotic animals, although the concentration of potassium in the mitochondria was unchanged. Incubation of mitochondria from hypokalemic animals with potassium partially restored the ability to incorporate ammonia, but without a significant change in the total mitochondrial potassium concentration.

2695 **ACTIVATION OF THE PHOSPHOFRUCTOKINASE OF RAT LIVER BY THYROID HORMONES *IN VIVO* AND *IN VITRO*.** *(It.)* Rinaudo, M. T. (Inst. Biol. Chem., U. Turin, Italy). *Boll Soc Ital Biol Sper* 44(19):1637-1638, 1968.

When male albino rats (initially 220-250 g) were fed dry thyroid extract (2% in the diet) for 10 days, they lost weight, the basal metabolic rate increased by 30%, and the phosphofructokinase activity in the liver homogenates (measured in Tris Buffer, pH 8.0 at 20C in the presence of ATP, MgS04, KC1 and fructose-6-phosphate) increased by 58% compared to controls fed a normal diet. When thyroxine (10^{-4}M) was added to normal rat liver homogenates, the phosphofructokinase activity was also increased by 36% (to 0.151 μmoles/g/hr compared to 0.121 in liver homogenates from normal controls without the addition of thyroxine).

2696 **SERUM AND LIVER β-GLUCURONIDASE ACTIVITY IN THE COURSE OF EXPERIMENTAL HEPATOCARCINOGENESIS INDUCED BY DIETHYL NITROSAMINE IN MICE.** *(E.)* Kordač, V. (Fac. Gen. Med., Charles U., Prague, Czechoslovakia), A. Braun and E. Schön. *Neoplasma (Bratisl)* 14(4):377-384, 1967.

White mice of both sexes weighing 33-36 g were given diethylnitrosamine in their drinking water in daily doses of 0.009 g/kg body weight. The experiment lasted 15 weeks and the average total dose of the agent was 0.945 g/kg. Five mice each from the treated and the control groups were sacrificed at 4, 6, 10 and 15 weeks. At autopsy the organs were examined macroscopically; the livers were weighed and a sample taken from each for enzyme determination. The remainder of the livers was fixed for histological study. A noticeable decrease in body weight in treated mice was seen as early as the 4th week. Gross alterations of the liver parenchyma were observed in treated mice. As early as the 6th week livers appeared moderately enlarged; from the 10th week on they were enlarged and of granulated surface, and by the 15th week tiny, yellow-whitish multiple nodules appeared. Livers of control animals were macroscopically and histologically normal. Histological findings in livers of treated animals were normal until the 6th week, when considerable regressive changes occurred. Several hepatocytes were protracted or of irregular triangular shape, their cytoplasm was basophilic and the nucleus moderately pyknotic. By the 15th week liver cells resembled atypical hepatomas. Increase in serum β-glucuronidase activity began in treated animals as early as the 6th week; at 15 weeks the values were twice that of controls. Liver β-glucuronidase activity began to increase later and noticeably after the 10th week; by the 15th week the values were more than double those for the controls. The differences were statistically highly significant; there was good correlation between morphological changes and increased enzyme activity.

2697 **ROLE OF PROTEIN IN REMOVAL OF COPPER FROM THE LIVER.** *(E.)* Gregoriadis, G. (McGill U., Lab. Chem. Neurobiology, Quebec, Canada) and T. L. Sourkes. *Nature* 218(5138):290-291, 1968.

Copper sulfate (1.25-2.50 mg Cu^{++}/kg/day) was given i.p. to Sprague-Dawley rats (100-200 g body weight) alone, before, at the same time as, or after the i.p. administration of actinomycin D (0.08 mg/kg), DL-ethionine (500 mg/kg) or acetocycloхexamide (0.25 mg/kg). All drugs were given daily for 3-5 days. D given with the injected copper or subsequently, resulted in the retention of considerably more copper than when copper sulfate was given alone. The concentration of copper in the liver of rats chronically fed an iron deficient diet has been reported to increase above control values. Protein synthetic mechanisms may also regulate the concentration of hepatic copper.

2698 **ALTERATION OF GLYCEROKINASE ACTIVITY IN RAT LIVER IN DIFFERENT NUTRITIONAL AND HORMONAL STATES.** *(E.)* Kampf, S. C. (Inst. Physiological Chem., U. Hamburg, Germany), H. J. Seitz and W. Tarnowski. *Life Sci* 7(16):815-825, 1968.

Liver glycerokinase activity was studied during starvation, fat feeding, in alloxan diabetes, after substitution of alloxan diabetes with insulin, and after cortisol injection into adrenalectomized groups of male Wistar rats weighing 150-200 g (in experiments with alloxan diabetes 250-300 g). There was a significant decrease with starvation that was eliminated within 18 hr of refeeding. Diminished enzyme activity was noted in alloxan diabetes, but increases were observed when insulin was administered, when cortisol was given the adrenalectomized animals, and during fat feeding. The increases of glycerokinase activity were suppressed by actinomycin. Alterations of enzyme activity did not depend on the blood glycerol offered the liver.

2699 **DIVERSE EFFECTS OF SKF 525-A AND ANTIOXIDANTS ON CARBON TETRACHLORIDE-INDUCED CHANGES IN LIVER MICROSOMAL P-450 CONTENT AND ETHYLMORPHINE METABOLISM.** *(E.)* Castro, J. A. (Natl. Heart Inst., Bethesda, Md.), H. A. Sasame, H. Sussman and J. R. Gillette. *Life Sci* 7(3):129-136, 1968.

Carbon tetrachloride (CCl_4) 2.5 ml/kg was administered p.o. to 3 groups of fasting Sprague-Dawley rats (140-180 g), one pretreated with d,1 α-tocopherol acetate (575 mg/kg i.p. in corn oil 40 hr before CCl_4, the second pretreated with DPPD (N,N-diphenyl-p-phenylenediamine), 600 mg/kg i.p. in corn oil 24 hr, 48 hr and 10 min before CCl_4, and the third SKF 525-A (β-diethylaminoethyl diphenylpropylacetate HCl) (50 mg/kg in saline i.p.) 30 min before CCl_4. Within 3 hr of administration of CCl_4 without pretreatment, the metabolism of ethylmorphine and the amount of the microsomal cytochrome P-450 was decreased 55-68%. Pretreatment with tocopherol and DPPD did not prevent this impairment but SKF 525-A delayed the loss of enzymatic activity for several hr. SKF 525-A pretreatment mitigated the necrosis caused by CCl_4 but not the loss of liver architectural pattern. DPPD prevented the loss of liver architectural pattern but not the necrosis caused by CCl_4.

2700 INTERRELATIONSHIPS BETWEEN ETHANOL AND PHENYLETHYLBIGUANIDE ON HEPATIC GLUCONEOGENESIS *IN VITRO*. *(E.)* Sandler, R. (Northwestern U. Med. Ctr., Chicago, Ill.), L. Vinnick and N. Freinkel. *Life Sci* 7(10):459-465, 1968.

Slices of liver from freshly-killed male albino rabbits (4-7 pounds) were incubated for 90 min in Krebs-Ringer Bicarbonate (KRB), pH 7.4, containing 1 mM ^{14}C-L-alanine (1 μC) and: a) nothing else, b) 10 mM ethanol (ETOH), c) 0.8 mM phenylethylbiguanide-HC1(PEBG), or d) 10 mM ethanol plus 0.8 mM (PEBG). ETOH caused a small reduction in alanine uptake and a greater reduction in the conversion of alanine carbons to ^{14}C-O_2 and ^{14}C-glucose. There was an increase in ^{14}C-lactic acid evolution and a diminished generation of ^{14}C-aspartic acid. ^{14}C-Glyceride-glycerol was preserved despite reduced ^{14}C-glucose. PEBG produced similar effects except aspartic acid was preserved, alanine uptake was not greatly reduced and ^{14}C glyceride-glycerol was inhibited at least as much as ^{14}C glucose. When the 2 were combined, additive depressions were exerted on QO_2 uptake, ^{14}C glucose and ^{14}C-O_2 while the effect of ETOH predominated on ^{14}C lactic acid and ^{14}C aspartic acid, and that of PEBG on ^{14}C glyceride-glycerol.

2701 DIFFERENCES IN THE KINETICS OF BENZPYRENE HYDROXYLATION BY HEPATIC DRUG-METABOLIZING ENZYMES FROM PHENOBARBITAL AND 3-METHYLCHOLANTHRENE-TREATED RATS. *(E.)* Alvares, A. P. (Wellcome Res. Lab., Tuckahoe, N. Y.), G. R. Schilling and R. Kuntzman. *Biochem Biophys Res Commun* 30(5):588-593, 1968.

Liver homogenates obtained from male Sprague-Dawley rats who had received either phenobarbital (PB) (50 mg/kg i.p. daily) for 4 days or 1 dose of 3-methylcholanthrene (3-MC), 20 mg/kg dissolved in corn oil i.p., were incubated with 2, 4, 6, 8, and 10 μg of 3,4-benzpyrene and an NADPH-generating system to measure the formation of 8-hydroxy-3,4-benzpyrene. Liver homogenates from untreated rats or PB-induced rats revealed Michaelis constants that were significantly different from those of the 3-MC treated ones. The maximal velocity was increased 4-fold after a single injection of 3-MC and 2.7-fold in rats treated with PB for 4 days. Similar differences in kinetic constants were observed using a supernatant (equivalent to 4 mg liver, wet weight) obtained by centrifugation at 9000 X g.

2702 A COMPARATIVE STUDY OF THE METABOLIC DISORDERS PRODUCED IN THE RAT LIVER BY ADMINISTRATION OF ALCOHOL AND OTHER COMPOUNDS. IV. THE EFFECTS OF INTRAPERITONEAL INJECTION OF GLUCOSE. *(Fr.)* Baron, P. (Lab. Human. Nutrit., I.N.S.E.R.M., Paris, France), G. Griffaton and R. Lowy. *Enzym Biol Clin (Basel)* 10(2):137-145, 1969.

When fasting male Wistar rats were given i.p. injections of glucose (5.2 g/kg) and sacrificed 15-90 min later, there was an increase in the hepatic concentrations of lactate, α-glycerophosphate, dihydroxyacetone phosphate, malate and oxaloacetate, a decrease in the hepatic concentrations of pyruvate, β-hydroxybutyrate and acetoacetate, and no change in the hepatic concentrations of NAD+ and NADH. These changes, which are ascribed to acceleration of the Krebs cycle, an antiketogenic effect and increased lipogenesis, were essentially the same as those previously obtained in experiments with glucose. A quantitative comparison of the results of fructose and glucose injections indicates, however, that the latter does not enter into the metabolic pathways as readily.

2703 THE BILIARY EXCRETION OF A SINGLE DOSE OF BROMSULFALEIN IN THE WISTAR RAT. II. CONSEQUENCES OF DISTURBANCES IN THE PORTAL AND HEPATIC CIRCULATION. *(Fr.)* Bernades, P. (Bichat Hosp., Paris, France), S. Bonfils and O. Halle-Pannenko. *Path Biol* 17(9/10):493-500, 1969.

In experiments on male Wistar rats, the biliary excretion of a single dose of BSP (% mg/100 g i.v. at a concentration of 10 mg/ml) was not significantly affected by injection of talcum powder into the mesenteric vein, nor even by ligation of the hepatic artery. Neither the general form of the excretion curve, the total percentage excreted in 3 hr, nor the time required for 50% excretion was altered by the disturbances in hepatic circulation. In both experimental and control rats, the BSP concentration in the bile passed through 2 phases: one with a high constant concentration followed by a phase of falling concentration; during the 2nd phase, the BSP output was an exponential function. On the other hand, the relative importance of the intermediate phase was increased in the experimental animals, at the expense of the early constant-output phase. This effect is ascribed to vascular exclusion of part of the hepatic parenchyma.

2704 GLYCOLYTIC REGULATION IN RAT LIVER AND HEPATOMAS. *(E.)* Lo, C.-H. (Temple U. Sch. Med., Philadelphia, Pa.), F. Farina, H. P. Morris and S. Weinhouse. *Advances Enzym Regulat* 6:453-464, 1968.

Whole fortified liver homogenates were incubated with fructose diphosphate (FDP) as substrate and 2-deoxyglucose, inorganic phosphate and yeast hexokinase were added to regenerate ADP from ATP formed by glycolysis, respiration, and glycolytic and respiratory phosphorylation. Endogenous respiration was high in well-differentiated tumors and low in poorly-differentiated ones, and in both types P/O ratios were 1 to 2. Addition of FDP to homogenates of well-differentiated tumors caused only low lactate formation and low glycolytic phosphorylation and no change in respiration or respiratory ATP production. In contrast, FDP addition to poorly-differentiated ones caused high glycolysis; and though oxidative phosphorylation was negligible, and respiration was not lowered, glycolytic phosphorylation was high. Replacement of particles of mitochondrial and supernatant fractions from a low-respiring, poorly-differentiated tumor by those of a high-respiring, well-differentiated one resulted in a pronounced Pasteur effect. Replacing high-respiring tumor particles with those of a low-respiring one resulted in decreased respiration and respiratory phosphorylation and increased glycolysis. Pyruvate kinase levels in the poorly-differentiated tumors were up to 20 times higher than in the well-differentiated ones. The high level of pyruvate kinase isoenzyme in the poorly-differentiated tumor consists mainly of the nonadsorbed form while the low level in the well-differentiated ones is largely adsorbable.

2705 ENERGY-DEPENDENT CONTROL OF THE TRICARBOXYLIC ACID CYCLE BY FATTY ACID OXIDATION IN RAT LIVER MITOCHONDRIA. *(E.)*

Garland, P. B. (U. Bristol, England), D. Shepard, D. G. Nicholls and J. Ontko. *Advances Enzym Regulat* 6:3-30, 1968.

In isolated mitochondria of rat liver, palmitoyl-(-)-carnitine oxidation had the following effects: (I) inhibition of citrate synthase, (II) inhibition of pyruvate dehydrogenase, (III) ininhibition of both NAD and NADP-specific isocitrate dehydrogenases, (IV) activation of pyruvate carboxylation and (V) activation of acetoacetate synthesis. All of these regulatory effects were released when energy conservation was abolished with uncoupling agents. The mechanisms for the regulatory effects of fatty acid metabolism are discussed in terms of the kinetic properties of the enzymes concerned. The effects of palmitoyl-carnitine oxidation on adenine nucleotide translocation across the mitochondrial membrane are considered to be of considerable importance in regulating the phosphorylation of intramitochondrial adenine nucleotides.

2706 THE ROLE OF CYCLIC AMP IN THE CONTROL OF LIVER METABOLISM. *(E.)*

Exton, J. H. (Vanderbilt U. Sch. Med., Nashville, Tennessee) and C. R. Park. *Advances Enzym Regulat* 6:391-407, 1968.

Gluconeogenesis from lactate in the perfused rat liver was stimulated by blood levels of glucagon and high levels of catecholamines, apparently through cyclic AMP mediation. The absence of any effect of glucagon on glucose or lactate formation from fructose suggests that cyclic AMP does not produce any significant effect on reactions between triose-P and glucose or on the conversion of P-pyruvate to pyruvate. Gluconeogenesis appears to be as sensitive as glycogenolysis to stimulation by glucagon, catecholamines and cyclic AMP. The nucleotide mimics the actions of the hormones on urea production and K^+ release by the perfused liver. The accumulation of cyclic AMP in the liver is promoted by much lower levels of glucagon than catecholamines and the maximum AMP concentration with glucagon is 20 to 30 fold higher than with epinephrine. Isopropyl norepinephrine stimulated glycogenolysis and cyclic AMP formation in the liver and the effects of epinephrine are blocked by pronethalol. Insulin deficiency produced by anti-insulin serum or alloxan causes an elevation of the liver cyclic AMP level *in vivo* which can be reversed by insulin. Perfused livers from antiserum-treated rats also show an increase in cyclic AMP which is reversed by insulin. Insulin also antagonizes the action of glucagon and epinephrine on glucose output. It lowers the level of cyclic AMP in normal livers and in those treated with glucagon or obtained from rats injected with antiserum. Adrenal glucocorticoids are required for a normal glucagon effect on lactate gluconeogenesis.

2707 LIVER LIPIDS OF RATS ADMINISTERED EXCESSIVE AMOUNTS OF RETINOL. *(E.)*

Misra, U. K. (V. P. Chest Inst., U. Delhi, India). *Canad J Biochem* 46:697-701, 1968.

The effect of i.m. administration of 100,000 IU/day retinol for 13 days on the liver lipid metabolism of young rats was studied. Excessive amounts of retinol did not affect body weight or daily food consumption. Retinol-treated rats showed a significant enlargement of the liver compared with controls. The values for liver total lipids, total cholesterol, total glycerides, total fatty acids, and retinol were 59.9 ± 0.9, 2.5 ± 0.1, 24.2 ± 1.3, 27.9 ± 1.8, and 1.35 ± 0.14 mg/g wet tissue, resp., in retinol-treated compared with control values of 37.0 ± 0.9, 1.8 ± 0.06, 9.5 ± 0.46, 17.6 ± 1.5, and 0.024 ± 0.008. Thin-layer chromatography revealed that excessive retinol administration caused significant increases in the concentrations of free cholesterol, esterified cholesterol, monoglycerides, triglycerides, lysophosphatidylcholine, phosphatidylcholine, and phosphatidylethanolamine and significant decreases in the concentration of phosphatidylinositol.

2708 PERFUSION OF ISOLATED LIVER: DETERMINATION OF ENZYMATIC ACTIVITIES.

(It.) Santambrogio, C. (Inst. Gen. Clin. Med., U. Milan, Italy), S. Negri, L. Tenconi, F. Civardi and S. Procaccia. *Biol Lat* 21(1):89-93, 1968.

Enzyme activity was determined in the homogenates of male rat liver, perfused by a perfusional circuit based on Miller's apparatus. Results showed a slight, but consistent increase in pseudocholinesterase; an unchanged activity of leucineaminopeptidase; and a decrease in all other enzymes determined: after 1 hr for lactic dehydrogenase, malic dehydrogenase, aldolase, and, slightly, for glucose 6-phosphodehydrogenase; after 4 hr for glutaric oxalacetic transaminase, glutaric pyruvic transaminase, glutaric dehydrogenase, sorbitol dehydrogenase and glucose 6-phosphatase. There was a slight decrease in alkaline phosphatase and in betaglucuronidase. The enzymatic damage involves all the metabolic pathways although at different times.

2709 MODIFICATION OF ENZYME ACTIVITIES IN DIETARY CIRRHOSIS AND FATTY INFILTRATION OF RAT LIVER. *(E.)*

Hendelman, L. U. (U. Michigan Med. Sch., Ann Arbor), E. G. Laughrey and K. S. Henley. *Enzym Biol Clin* 10(9):1-7, 1969.

The activities of enolase, phosphohexose isomerase and lactate dehydrogenase in cirrhotic and fatty livers were determined in 27 male Sprague-Dawley rats placed on a cirrhogenic diet for from 12-24 weeks. The number of parenchymal cells in the fatty livers averaged 60,000 ± 203/mg of tissue. Enzyme activities in fatty livers were similar to those in cirrhotic livers. There was no difference between fatty and cirrhotic liver in the weight of the insoluble tissue protein or the concentration of the supernatant protein. The activity per cell of the three enzymes was increased in all abnormal animals when compared with controls. When enzyme activity was expressed on a basis of fresh weight corrected for the insoluble portion of the homogenate, all three enzyme activities were increased in the fatty liver as compared to controls while only lactate dehydrogenase was elevated in the cirrhotic animals.

2710 **INTRACELLULAR DISTRIBUTION OF HEPATIC CARBONIC ANHYDRASE IN MICE BEARING EHRLICH ASCITES CARCINOMA OR WITH SPONTANEOUS MAMMARY CARCINOMA.** *(E.)* Suzuki, S. (Sch. Med., Gunma U., Maebashi, Japan) and E. Ogawa. *Gunma J Med Sci* 16(1):74-78, 1967.

Adult male ddN mice were inoculated i.p. with Ehrlich ascites carcinoma cells (5×10^6/0.1 ml in saline) and sacrificed after 7 days. Swiss female albino mice with spontaneous mammary carcinoma were also sacrificed. Samples were prepared and assays for carbonic anhydrase activity performed. Hepatic carbonic anhydrase activity was decreased in homogenate, microsomal, and supernatant fractions as compared with controls. Protein blood carbonic anhydrase activity, hemoglobin concentration and liver weight were unchanged in every fraction. In mice with the spontaneous mammary carcinoma, hepatic carbonic anhydrase activity was decreased in homogenate, mitochondrial, microsomal, and supernatant fractions as compared with controls. Protein in the mitochondrial fraction was increased without producing any alterations in the other fractions. Blood carbonic anhydrase activity and hemoglobin concentration were decreased. There was a marked gain in liver weight in the carcinoma-bearing group.

2711 **ALDOLASE ACTIVITIES IN THE LIVER AND IN THE KIDNEY OF RATS CHRONICALLY POISONED WITH $HgCl_2$.** *(E.)* Riario-Sforza, G. (Inst. Chem. Biol., Siena, Italy), M. Gentili, P. Martini, E. Marinello and R. Pagani. *Ital J Biochem* 16(6):382-386, 1967.

2712 **ENZYMES OF THE PYRUVATE CYCLE IN A CASE OF GLYCOGENOSIS.** *(E.)* Bossu, M. (Inst. Chem. Biol., U. Urbino, Italy), M. Gargano and G. Fornaini. *Ital J Biochem* 17(2):107-117, 1968.

2713 **INTERMEDIARY METABOLITES OF GLYCOLYSIS AND ADENINE NUCLEOTIDES IN RAT LIVER *IN VIVO*. I. EFFECTS OF AN ISCHEMIC CYCLE.** *(Fr.)* Leroux, J. P. (Lab. Med. Enzymology, Nat. Inst. Hlth. Med. Res., Paris, France), H. Lorer and P. H. Cartier. *CR Soc Biol (Paris)* 162(5-6):1059-1064, 1968.

2714 **INTERMEDIARY METABOLITES OF GLYCOLYSIS AND ADENINE NUCLEOTIDES IN RAT LIVER *IN VIVO*. II. THE EFFECTS OF 2,4- DINITROPHENOL.** *(Fr.)* Lorer, H. (Lab. Med. Enzymology, Nat. Inst. Hlth. Med. Res., Paris, France), J. P. Leroux and P. H. Cartier. *CR Soc Biol (Paris)* 162(5-6):1120-1123, 1968.

2715 **ALCOHOL DEHYDROGENASE AND ETHANOL METABOLISM.** *(E.)* Ting-Kai, L. (Peter Bent Brigham Hosp., Boston, Mass.) and B. L. Vallee. *Surg Clin N Amer* 49(3):577-582, 1969.

2716 **ELECTROPHORETIC AND IMMUNOELECTROPHORETIC CHARACTERISTICS OF BILE PROTEINS.** *(Sp.)* Diaz-Rubio, M. Jr. (Fac. Med., U. Madrid, Spain) and M. Diaz-Rubio. *Rev Esp Enferm Apar Dig* 28(2): 173-180, 1969.

2717 **NONSPECIFIC CARBON TETRACHLORIDE INTOXICATION OF VITAL CELL FUNCTIONS IN THE LIVERS OF ADRENALECTOMIZED RATS ON CORTISOL THERAPY.** *(Ger.)* Seitz, H. J. (Inst. Physiol. Chem., U. Hamburg, Germany) and W. Tarnowski. *Hoppe Seyler Z Physiol Chem* 349(12):1800-1802, 1968.

2718 **HISTOCHEMICAL STUDIES OF THE ENZYMES ADENOSINE TRIPHOSPHATASE, ALKALINE AND ACID PHOSPHATASE, AND SUCCINIC DEHYDROGENASE IN THE HEPATIC PARENCHYMA OF RATS IN THE PRESENCE OF THE CARCINOGEN, DIETHYLNITROSOAMINE.** *(Ger.)* Borner, P. (Max Planck Inst. Virol., Tübingen, Germany) and W. Gossner. *Z Naturforsch [B]* 23(8):1085-1091, 1968.

2719 **EFFECT OF ALCOHOL ON GLUCONEOGENESIS USING THE ISOLATED RAT LIVER PERFUSION TECHNIQUE.** *(E.)* Kaden, M. (U. Pittsburgh Sch. Med., Pa.), N. W. Oakley and J. B. Field. *Amer J Physiol* 216(4):756-763, 1969.

2720 **EFFECT OF ACID-BASE STATUS ON RENAL AND HEPATIC GLUCONEOGENESIS IN DIABETES AND FASTING.** *(E.)* Kamm, D. E. (U. Rochester Sch. Med. Dent., N. Y.) and G. F. Cahill Jr. *Amer J Physiol* 216(5):1207-1212, 1969.

2721 **EFFECT OF ALBUMIN CONCENTRATION ON ALBUMIN SYNTHESIS IN THE PERFUSED LIVER.** *(E.)* Rothschild, M. A. (New York U. Sch. Med., N. Y.), M. Oratz, J. Mongelli and S. S. Schreiber. *Amer J Physiol* 216(5):1127-1130, 1969.

2722 **STUDY OF THE BIOLOGICAL ACTION OF BENZO(a)PYRENE. I. THE EFFECT OF UV IRRADIATION AND SOME CHEMICAL AGENTS ON LIVER HYDROXYLASE INDUCTION PRODUCED BY BENZO(a)PYRENE.** *(Fr.)* Rondia, D. (Lab. Toxicol., U. Liege, Belgium) and P. Delwaide. *Biochem Pharmacol* 17(10):2171-2177, 1968.

2723 **DIETARY INDUCTION OF SOME ENZYMES OF AMINO ACID METABOLISM DURING 2-ACETYLAMINOFLUORENE FEEDING.** *(E.)* Poirier, L. A. (Med. Sch. U. Wisconsin, Madison) and H. C. Pitot. *Cancer Res* 29(2):464-469, 1969.

2724 **DIETARY INDUCTION OF SOME ENZYMES OF CARBOHYDRATE METABOLISM DURING 2-ACETYLAMINOFLUORENE FEEDING.** *(E.)* Poirier, L. A. (Med. Sch., U. Wisconsin, Madison), M. C. Poirier and H. C. Pitot. *Cancer Res* 29(2):470-474, 1969.

2725 **DIETARY INDUCTION OF SOME ENZYMES OF AMINO ACID METABOLISM DURING AZO DYE FEEDING.** *(E.)* Poirier, L. A. (Med. Sch., U. Wisconsin, Madison) and H. C. Pitot. *Cancer Res* 29(2):475-480, 1969.

2726 **THE EFFECTS OF ESSENTIAL FATTY ACID DEFICIENCY ON THE LIVER MITOCHONDRIA OF THE RAT AND MOUSE. STRUCTURAL AND FUNCTIONAL ALTERATIONS.** *(E.)* Smithson, J. E. (Brown U. Div. Biol. Med. Sci., Providence, R. I.). *Lab Invest* 20(2):207-212, 1969.

2727 **SYNTHESIS OF DNA AFTER PARTIAL HEPATECTOMY WITHOUT CHANGES IN THE LIPID AND GLYCOGEN CONTENTS OF THE LIVER.** *(E.)* Simed, J. F. (U. Pittsburgh, Sch. Med., Pa.), F. Rubin and I. Lieberman. *Biochem Biophys Res Commun* 30(5):571-575, 1968.

2728 **BILE SALT REGULATION OF HEPATIC EXCRETORY FUNCTION. [EDITORIAL]** *(E.)* Javitt, N. B. (New York Hosp. Cornell Med. Ctr., N. Y.). *Gastroenterology* 56(3):622-625, 1969.

2729 **NUCLEIC ACIDS AND PROTEIN SYNTHESIS IN CANCER CELL MITOCHONDRIA. II. AMINO ACID INCORPORATION INTO PROTEINS OF RAT LIVER AND HEPATOMA CELL MITOCHONDRIA.** *(E.)* Inaba, K. (Okayama U. Med. Sch., Japan). *Acta Med Okayama* 22(2):101-112, 1968.

2730 **STIMULATION OF *IN VITRO* GROWTH OF RAT LIVER CELLS WITH CALF SERUM DRAWN FOLLOWING PARTIAL HEPATECTOMY.** *(E.)* Hays, D. M. (U. Southern California Sch. Med., Los Angeles), I. Tedo and Y. Matsushima. *J Surg Res* 9(3):133-137, 1969.

2731 **STATISTICAL STUDY ON THE RATIO BETWEEN β- AND α-LIPOPROTEINS, TRIGLYCERIDES AND CHOLESTEROL.** *(E.)* Antonini, F. M. (U. Florence, Italy), A. Bucalossi, A. D'Alessandro, P. Contini and G. Pazzagli. *Clin Chim Acta* 24(1):19-21, 1969.

2732 **THE METABOLIC INTERRELATIONSHIP AND PHYSICOCHEMICAL ANALYSIS OF C-REACTIVE PROTEIN AND HEPATIC CATALASE.** *(E.)* Hokama, Y. (U. Hawaii Sch. Med., Honolulu), K. Yamada, S. N. Moikeha and E. T. Nishimura. *Cancer Res* 29(3):542-548, 1969.

2733 **DIETARY CARBOHYDRATES AND BODY LIPIDS IN RATS.** *(E.)* Bhattathiry, E. P. M. (U. Malaya, Kuala Lumpur, Malaysia). *Med J Malaya* 23(2):123-126, 1968.

2734 **THE EFFECTS OF CARBON TETRACHLORIDE ADMINISTRATION ON THE LIPID AND FATTY ACID COMPOSITIONS IN RAT LIVER.** *(E.)* Hasegawa, S. (Mie Prefect. U. Sch. Med., Tsu, Japan), K. Kasama and N. Uezumi. *Mie Med J* 17(3):235-247, 1968.

2735 **RETICULOENDOTHELIAL FUNCTION IN THE ISOLATED PERFUSED LIVER. IV. PHAGOCYTOSIS OF AGGREGATED-BSA AND COLLOIDAL GOLD. EVIDENCE FOR NONSPECIFIC OPSONINS.** *(E.)* Jeunet, F. S. (Variety Club Heart Hosp., Minneapolis, Minn.) and R. A. Good. *Proc Soc Exp Biol Med* 131(1):112-115, 1969.

See also: 2650,3213,3223,3235,3237,3245,3312

2736 EFFECTS OF SULFATION OF TAUROLITHOCHOLIC AND GLYCOLITHOCOLIC ACIDS ON THEIR INTESTINAL TRANSPORT.

(E.) Low-Beer, T. S. (Duke U. Med. Ctr., Durham, N. C.), M. P. Tyor and L. Lack. *Gastroenterology* 56(4):721-726, 1969.

The intestinal transport of the 3-α-sulfate esters of glycolithocholic and taurolithocholic acids was studied in a perfused, isolated segment of guinea pig small intestine with an intact blood supply. Absorption of these compounds was by active transport and was limited to the ileum. This contrasts with the nonsulfated compounds which can be reabsorbed from all sections of the small bowel. Absorption of the nonsulfated compounds was greater in the distal region, probably reflecting two processes: 1) active absorption and 2) passive diffusion. In the proximal regions, only passive diffusion occurred. Ileal transport of sulfated taurolithocholate was depressed by the presence of sodium taurocholate. These results support the concept that sulfation of the potentially toxic lithocholic acid bile salts could curtail their intestinal absorption and enhance their fecal elimination rates.

2737 AMINO ACIDS AND BIOELECTRIC POTENTIALS IN THE SMALL INTESTINE OF THE GREEK TORTOISE.

(E.) Gilles-Baillien, M. (Dept. Biochem., U. Liege, Belgium) and E. Schoffeniels. *Life Sci* 7(1):53-63, 1968.

Transmucosal and transserosal electrical potentials were measured in isolated active tortoise, small intestine that was placed in a saline bath to which amino acids were added. The addition of L-alanine resulted in an increase in transepithelial potential through an increased transserosal potential. The dicarboxylic acids L-glutamate and L-aspartate increased both transmucosal and transserosal potentials. The basic amino acids L-lysine and L-arginine affected none of the potentials. When the KCl concentration of the mucosal saline bath was increased in the presence of L-alanine no effect was noted. When its concentration in the serosal bath was increased from 2.5 to 6.4 mM there was a large decrease in transepithelial potential. With a ten-fold dilution of NaCl in the mucosal bath in the presence of L-alanine, the increase in transepithelial potential due to L-alanine was greatly reduced. A ten-fold dilution of NaCl in the serosal bath under the same conditions greatly increased transepithelial potential. The addition of L-alanine to sulphated saline induced an increase of transepithelial potential as it did when the epithelium had been washed several times in sulphated solutions. L-alanine is actively transported across the Greek tortoise intestinal epithelium. The mechanism (that could be related to the synthesis of this amino acid) is located at the serosal border and is controlled by sodium ions.

2738 BIOSYNTHESIS OF METHIONINE IN THE LIVER OF LEUKAEMIC MICE.

(E.) Pristoupilova, K. (Inst. Hematology Blood Transfusion, Prague, Czechoslovakia). *Neoplasma (Bratisl)* 14(4):353-358, 1967.

Inbred male and female AKR mice, 6-8 weeks old, were given i.p. inoculations of L 14 AKR leukemia cells. Inbred male and female C57 Black mice were inoculated i.p. with LaH VUFB leukemia cells. The mean survival time of animals inoculated with either leukemia was 8-10 days. The experimental mice were sacrificed and the enzyme activity determined in extracts from homogenized livers. Methionine biosynthesis was determined from the amount of ^{14}C incorporated into methionine from DL-3-^{14}C serine. A significant increase in methionine biosynthesis was found in all leukemic mice at the 7th day after inoculation with L 14 AKR leukemia. To confirm that the increase was due to the leukemic process, the livers of AKR mice with spontaneous leukemia were also studied. Methionine biosynthesis was also increased in all these animals but values in controls remained low. Methionine biosynthesis was also studied in relation to various phases of leukemia. Even on the 5th day after inoculation an increase in methionine biosynthesis was detected. The differences in the formation of methionine in normal and leukemic mice corresponded to the development of the disease and were not caused by a difference in reaction kinetics.

2739 LIPOLYTIC ACTIVITY OF FUNGI IN THE INTESTINAL FLORA.

(It.) Ferri, S. (Inst. Clin. Gen. Med., U. Bologna, Italy) and L. Sammarro. *Riv Gastroent* 20(3):202-210, 1968.

Seventy-nine specimens were examined: 49 were Candida, 11 Geotrichum, 3 Cryptococcus, 7 Aspergillus, 5 Penicillium and 3 Rhizopus. All the Candida, Geotrichum, Cryptococcus, and Penicillium specimens had lipolytic activity while only 4 of 7 of the Aspergillus and 1 of 3 of the Rhizopus showed such activity. Lipolytic activity was most apparent after 3-4 days of culture, although *Aspergillus fumigatus* activity was demonstrated after 10 days. *Candida albicans, Candida tropicalis, Candida brumptii, Geotrichum candidum* and Penicillium showed the most and the earliest lipolytic activity.

2740 CELL TURNOVER IN THE RAT SMALL INTESTINAL MUCOSA: AN APPRAISAL OF CELL LOSS.

(E.) Loehry, C. A. (St. Thomas Hosp., London, England), D. N. Croft, A. K. Singh and B. Creamer. *Gut* 10(1):13-18, 1969.

Cell turnover in the small intestinal mucosa was studied in both normal and abnormal rats. Cell turnover was studied in normal rats by techniques evaluating cell loss since it was found that cell migration from the crypts to the villi in the small intestinal mucosa could not be a direct process. Small intestinal perfusions were performed, desquamated cells collected, and their total volume was assessed by the rate of DNA loss in the perfusions. In addition newly formed crypt cells were labelled with ^{59}Fe, and the radioactivity was counted in the cells desquamated at varying time intervals after injection of the isotope. Histological sections of the intestine after a 4 hr perfusion showed no evidence of damage or appreciable trauma to villous structures. The mean DNA excretion rate from 5 normal rats was 2.2 mμg atoms of DNA-P/min. There was a high initial level of radioactivity in perfusions performed immediately after the injection of ^{59}Fe. This was followed by a decrease to a baseline at 5 hr. There was then no further rise in the specimens until 36 hr after injection when a prominent peak appeared. After 48 hr there was a return to baseline. It was felt that the epithelial cells emerging from the crypts move in some way to be channeled onto the villi. The intervillous ridges seen between the adjacent crypts probably represent these epithelial migration lines. In abnormal rats with a small intestinal mucosa 'flattened' after infestation with the nematode *Nippostrongylus brasiliensis*, a considerably increased rate of cell loss was demonstrated suggesting an increased turnover state.

See also: 2647

2741 **GASTRIC MUCOSAL BLOOD FLOW DURING SECRETORY INHIBITION BY GASTRIN PENTAPEPTIDE AND GASTRONE.** *(E.)* Cowley, D. J. (Mayo Clin., Rochester, Minn.), C. F. Code and R. Fiasse. *Gastroenterology* 56(4):659-665, 1969.

The aminopyrine clearance technique was used in 3 female dogs to quantitate the gastric mucosal blood flow during secretory inhibition by a single, rapid i.v. injection of gastrin pentapeptide (ICI 50,123) and of gastrone. A dose of 40 or 50 μg of gastrin produced a 68% reduction of blood flow and a 72% reduction of secretion. Reduction of blood flow appeared to precede reduction of secretion, and blood flow subsequently recovered more rapidly than did secretion. A dose of 150 μg of gastrone produced a 55% reduction of blood flow and a 66% reduction of secretion, but there was a lag of 1 hr after the injection of gastrone before secretion or blood flow was affected. Changes in blood flow and secretion were closely related during secretory inhibition by both gastrin (r = 0.95) and gastrone (r = 0.92).

2742 **PATHOPHYSIOLOGIC EFFECTS OF BOWEL DISTENTION ON INTESTINAL BLOOD FLOW.** *(E.)* Boley, S. J. (Montefiore Hosp. Med. Ctr., Brooklyn, N. Y.), G. P. Agrawal, A. R. Warren, F. J. Veith, B. S. Levowitz, W. Treiber, J. Dougherty, S. S. Schwartz and M. L. Gliedman. *Amer J Surg* 117(2):228-234, 1969.

One or more segments of small or large bowel (12-18 and 6-12 inches long, resp.) were isolated in 35 mongrel dogs so as to receive their blood supply from a single artery. A multihole catheter was inserted into each segment, attached to a constant-pressure apparatus which maintained intraluminal pressure with air at selected levels, and the segments were ligated at both ends. Intraluminal pressures above 30 mm Hg consistently produced a decrease in intestinal blood flow. Increasing pressures produced a further decline in blood flow until an irreducible 20-35% of flow remained. With decreased flow there was an associated decrease in the arteriovenous oxygen difference. With pressures above 60-90 mm Hg only submucosal and serosal vessels were filled. Krypton 85 washout studies at these pressures suggested a shift of blood away from the mucosa. It is suggested that increased intraluminal pressure, intestinal ischemia, and hypoxia play a role in the colitis developing proximal to colonic neoplasms.

2743 **EXCHANGE CIRCULATION OF THE SMALL INTESTINE ON CONTROLLED BLEEDING IN THE RAT.** *(E.)* Nylander, G. (U. Hosp., Uppsala, Sweden). *Scand J Gastroent* 4(2):121-125, 1969.

The uptake of a diffusable, water-soluble test substance (^{131}I Na) from a dimensionally and positionally defined intestinal segment was measured in 90 male Sprague-Dawley rats. Immediately after and 5 hr after the removal of 5 ml and 6 ml of blood, 27% and 33% of the total blood volume, resp., the exchange circulation of the intestinal mucosa was either negligibly reduced or not at all. Hemorrhagic necrosis in the small intestine mucosa occurred in only 3 (after 5 hr and extraction of 6 ml of blood). All of these animals were excluded. The others showed no signs of irreversible shock and all survived the 5-hr period between the bleedings and the recordings. A loss of up to 30% of the total blood volume caused only an extremely slight reduction of the exchange circulation of the intestinal mucosa. The capillary flow in the mucosa necessary for practically normal elimination of the ^{131}I was thus retained in spite of a major loss of blood. Reduction of the capillary flow in the intestinal mucosa seems not to occur until the final, total collapse, when shock becomes irreversible and the hemorrhagic necrosis is the morphological expression of the anoxic damage to the intestinal mucosa.

2744 **SIMULTANEOUS MEASUREMENTS OF HEPATIC AND PORTAL VENOUS BLOOD FLOW IN THE SHEEP AND DOG.** *(E.)* Katz, M. L. (New York State Veterinary Coll., Ithaca) and E. N. Bergman. *Amer J Physiol* 216(4):946-952, 1969.

2745 **PHYSIOLOGIC ROLE OF RENINLIKE CONSTITUENT OF SUBMAXILLARY GLAND OF THE MOUSE.** *(E.)* Takeda, T. (U. Texas Southwestern Med. Sch., Dallas), J. DeBusk and A. Grollman. *Amer J Physiol* 216(5):1194-1198, 1969.

2746 **MEMBRANE POTENTIALS IN UNSTIMULATED PAROTID GLAND OF THE CAT.** *(E.)* Fritz, M. E. (U. Pennsylvania, Sch. Med., Philadelphia) and S. Y. Botelho. *Amer J Physiol* 216(5):1180-1183, 1969.

2747 **EFFECT OF PROLONGED STARVATION ON BLOOD LIPID LEVELS OF OBESE SUBJECTS.** *(E.)* Jackson, I. (Royal Infirm., Glasgow, Scotland). *Metabolism* 18(1):13-17, 1969.

2748 **PHYSICAL STATE OF BILE ACIDS IN INTESTINAL CONTENTS OF GERMFREE AND CONVENTIONAL RATS.** *(E.)* Gustafsson, B. E. (Karolinska Inst., Stockholm, Sweden) and A. Norman. *Scand J Gastroent* 3(6): 625-631, 1968.

2749 **RHEOGRAPHIC DATA ON THE HEMODYNAMICS OF THE HEPATIC AREA DURING PHYSICAL ACTIVITY.** *(It.)* Rottini, E. (Inst. Med. Symptomatol., U. Perugia, Italy) and M. Martinelli. *Ann Fac Med Chir Univ Perugia* 59(1):91-103, 1967.

2750 **EGG-PRODUCTION IN ANCYLOSTOMA IN RELATION TO THE SEX RATIO AND THE DURATION AND INTENSITY OF INFECTION.** *(Ger.)* Hinz, E. (Inst. Trop. Hyg. Publ. Hlth., U. Heidelberg, Germany). *Z Tropenmed Parasit* 18(4):403-408, 1967.

2751 **THE EFFECT OF CERTAIN DRUGS ON THE ALBUMIN BINDING CAPACITY FOR BILIRUBIN** *(IN VITRO)*. *(Gr.)* Malaka-Zafeiriou, K. (Pediat. Clin., Aristotelian U. Thessalonika, Greece), V. Khormova and S. Kharokopos. *Galenus* 9(8):483-500, 1967.

2752 **THE TRANSPORT OF NON-CONJUGATED BILIRUBIN IN THE PLASMA.** *(Fr.)* Housset, E., J. P. Etienne and J. P. Petite. *Ann Biol Clin (Paris)* 25(10/12): 969-983, 1967.

2753 **INTESTINAL RESPONSE TO CHANGING GASEOUS ENVIRONMENTS: NORMOBARIC AND HYPERBARIC OBSERVATIONS.** *(E.)* Saltzman, H. A. (Duke U. Med. Ctr., Durham, N. C.) and H. O. Sieker. *Ann NY Acad Sci* 150(1):31-39, 1968.

2754 **THE ROLE OF INTESTINAL FLORA IN GAS FORMATION.** *(E.)* Gall, L. S. (IBM Corp., Space Systems Ctr., Bethesda, Md.). *Ann NY Acad Sci* 150(1):27-30, 1968.

2755 **GASTROENTEROLOGIC ASPECTS OF MANNED SPACEFLIGHT: COMMENTS ON GASTROINTESTINAL GAS AND ENVIRONMENTAL STRESS.** *(E.)* Pfeiffer, C. J. (Harvard Sch. Publ. Hlth., Boston, Mass.). *Ann NY Acad Sci* 150(1):40-48, 1968.

DIAGNOSTIC PROCEDURES

2756 STUDIES ON THE POSSIBLE CARDIOVASCULAR COMPLICATIONS DURING INTRAMUSCULAR CHOLANGIOCHOLECYSTOGRAPHY USING A NEW HEXAIODINATED CONTRAST MEDIUM. *(It.)* Strozzi, C. (Inst. Gen. Med. Clin., U. Ferrara, Italy) and A. Biolcati-Rinaldi. *Arch Ital Mal Appar Dig* 35(3):271-302, 1968.

When 20 patients (10 males and 10 females, 15-80 yr old) were subjected to i.m. cholangiocholecystography with Bilivistan (ioglycamide; 24-28 cc mixed with hyaluronidase) for the radiological diagnosis of hepatobiliary disease (acute cholangitis, cholelithiasis, hepatic insufficiency), there were no significant side effects. Clinical, electrocardiographic and blood pressure studies revealed neither allergic reactions nor any effects on the cardiovascular system, even though 5 of these patients had cardiovascular disease (myocardiosclerosis, previous myocardial infarction, cerebral arteriosclerosis) and others had glomerulonephritis or other conditions which would normally render them hypersensitive to toxic agents. The visualization of the gallbladder and bile ducts was generally excellent, and was comparable to that produced by i.v. Bilivistan, which has been responsible for many severe complications and even death. Individual case reports are presented for the 20 patients. These results confirm the general safety of i.m. Bilivistan as reported in the literature, based on experience with more than 2000 cases.

2757 THE INDUCED URINARY EXCRETION OF BSP: ITS USE IN THE DIAGNOSIS OF JAUNDICE. *(Fr.)* Toulet, J. (Internatl. Hosp., U. Paris, France), J. Lunel, J. Rousselet and G. Albot. *Actualites Hepatogastroent Hotel Dieu* 5(1):B11-B38, 1969.

A technique is described for the induced urinary BSP excretion test and preliminary results are presented for 13 patients illustrating how this test can assist in the proper diagnosis of jaundice. These 13 cases, each of which is presented individually in considerable detail, included patients with obstructive jaundice due to choledochal lithiasis, cancer of the common duct, compression of the common duct by tubercular lymph nodes, icterigenic viral hepatitis, drug-induced cholestatic hepatitis, and subacute alcoholic hepatitis complicated by viral hepatitis. The urinary BSP excretion curve is concluded to be particularly valuable in the diagnosis of slowly-developing biliary tract obstruction and cholestatic hepatitis, which are often misdiagnosed on the basis of the clearance of BSP from the blood. The urinary excretion test can provide a correct diagnosis in about 75% of those cases (amounting to about 30% of all patients tested) in which the blood clearance curve is indecisive. Of the remaining 8% of all cases, about half cannot be diagnosed accurately by either technique, and in about half (4% of the total) the urinary test yields a misleading result which contradicts the result of the blood clearance curve.

2758 THE VALUE AND LIMITATIONS OF THE COMMON RADIOLOGICAL FINDINGS IN THE DIAGNOSIS OF MALIGNANT NEOPLASMS OF THE PANCREAS. *(It.)* Gavelli, G. P. (Inst. Radiol., U. Bologna, Italy), R. Roversi and L. de Florio. *Riv Gastroent* 20(2):97-148, 1968.

Among 47 patients (28 men and 19 women, 41-79 yr old) with primary pancreatic neoplasms (34 of the head, 5 of the body, 3 of the tail, and 5 diffuse) confirmed by surgery or autopsy, only 6 were definitely diagnosed before surgery (in addition to 17 doubtful cases) but another 11 diagnoses (as well as 27 doubtful cases) were considered to have been radiologically possible *a posteriori*. The most common radiological signs were infiltration or compression of the duodenum (23 and 19 cases, resp.) and compression or infiltration of the stomach (14 and 6 cases, resp.). Other findings, generally seen only in cases of diffuse pancreatic cancer, included urinary tract anomalies, abnormalities revealed by a direct examination of the abdomen, and involvement of the lungs, bones or biliary tract. Some radiological sign indicative of pancreatic cancer was present in 81% of the cases, but none of these signs could be considered pathognomic. It is concluded that determining the neoplastic, inflammatory or benign nature of a particular lesion is generally easier than determining its specific origin in the pancreas. The literature on the radiological diagnosis of pancreatic cancer is also reviewed, with a tabulation of the success rates and the most common radiological signs in the gastroduodenal tract.

2759 MEASUREMENT OF GASTROESOPHAGEAL REFLUX. *(E.)* Kantrowitz, P. A. (Harvard Med. Sch., Boston, Mass.), J. G. Corson, D. J. Fleischli and D. B. Skinner. *Gastroenterology* 56(4):666-674, 1969.

A test for the detection of gastroesophageal reflux incorporating the use of esophageal manometry, intraluminal pH recording, an acid microparticle suspension of barium, and fluoroscopy was used in 12 patients and 17 control subjects (no demonstrable hiatal hernias and/or symptoms of reflux). The method used involved monitoring the pH 5 cm above the lower esophageal sphincter (located by manometry) with a known volume of acid barium in the stomach while the subject performed a series of postural and respiratory maneuvers in an unvaried sequence. Radiography did not add substantially to the information obtained by pH monitoring, but was useful in verifying the presence of massive reflux. The test proved valid in distinguishing between normal and abnormal reflux on a semiquantitative scale. This method provides an objective technique to investigate the effects of drugs and various operations on the gastroesophageal junction, and to determine further understanding of normal and abnormal function.

2760 RADIOTELEMETRY FOR THE STUDY OF INTESTINAL PERISTALSIS. *(Dan.)* Banke, L. (State Hosp., Copenhagen, Denmark). *Ugeskr Laeger* 130(12): 500-504, 1968.

A detailed description is presented, with block and wiring diagrams, of a radiotelemetering capsule developed by Electronics Industrial Ltd. of London for the measurement of intraluminal pressure changes. This capsule, which operates on the principle of variable inductance (movement of a ferrite rod attached to a membrane) at frequencies between 300 and 400 kilocycles/sec, is 25.5 mm long with a diameter of 9.4 mm. Its sensitivity to both pressure and temperature changes is high (30 kilocycles/sec per 100 cm H_2O and the equivalent of 14 cm

H_2O per degree Centigrade), and the capsule can operate for 40-50 hr thanks to a Mollery RM 312 H battery. Signals are received by a sensitive FM-receiver (modified Heathkit model RG-1 communications receiver) via an amplified antenna and recorded by a Southern direct-recording ultraviolet oscillograph M 1300 with an SMI/P galvanometer and a paper speed of 17 mm/min. Some preliminary records of intestinal motility obtained by this device in healthy volunteers are illustrated. It is pointed out that the pressure curves obtained in this way require automatic analysis, which prevents routine use of this technique in daily practice.

2761 **SIMULTANEOUS MEASUREMENT OF INTRALUMINAL PRESSURE AND pH IN THE STOMACH AND ESOPHAGUS: A SPECIAL STUDY PERTAINING TO THE DIAGNOSIS OF HIATUS HERNIA AND CARDIAL INSUFFICIENCY.** *(Dan.)* Borgeskov, S. (State Hosp., Copenhagen, Denmark) and K. Lockwood. *Ugeskr Laeger* 130(12):493-498, 1968.

Simultaneous measurements of pressure and pH (by means of a Statham pressure transducer and a glass electrode, resp.) were carried out in 27 patients with hiatus hernia, 7 of whom were studied both pre- and postoperatively. Among 9 patients with dysphagia and heartburn who did not come to surgery, 3 had regurgitation on the basis of pH measurements and 2 others had a hiatus hernia on the basis of pressure measurements (confirmed by X-ray), but other hernias revealed by X-ray were not diagnosed by the combined technique. Among 9 patients with definite hernias (6 sliding, 2 combined and 1 paraesophageal) later treated surgically, 4 had normal preoperative pH measurements and 3 had normal pressure readings. The postoperative findings in 16 patients (including 7 of the previous 9) showed persistent esophageal reflux in 7 cases, while pressure measurements revealed only 1 case of persistent hernia; postoperative X-rays were normal in all but 2 cases. It is concluded that pH measurements are valuable in the diagnosis of cardial insufficiency and esophageal reflux. Pressure measurements are most valuable in assuring proper placement of the pH electrode in the esophageal hiatus, but by themselves they contribute little to the differential diagnosis of hiatus hernia. Measurements of this type are also valuable in the postoperative follow-up of patients operated on for hiatus hernia.

2762 **PREOPERATIVE INDUCTION OF DUMPING WITH APOMORPHINE.** *(Dan.)* Gudmand-Hoyer, E. (State Hosp., Copenhagen, Denmark) and H. J. Fenger. *Ugeskr Laeger* 130(24):1010-1013, 1968.

The results of a simple new prognostic test for postoperative dumping, using 0.5 mg of apomorphine s.c., were compared with those of glucose provocation (50 g p.o.) and with the actual postoperative results in 66 patients operated on for peptic ulcers and in 16 healthy volunteers (total of 497 tests). Preliminary studies in the 16 volunteers showed that the dumping stimulus produced by 280 ml of 18% glucose was about the same as that produced by 0.5 mg apomorphine, while 0.75-1.0 mg apomorphine produced stronger reactions. This correlation was also demonstrated ($p < 0.001$) by tests on 44 patients with gastrectomy-induced dumping syndromes, a discrepancy being noted in only 1 case. Furthermore, all 10 patients with moderate-severe spontaneous dumping also showed moderate-severe dumping in response to apomorphine, and 32 of the 34 patients with little or no spontaneous dumping also showed insignificant dumping in response to apomorphine. In 22 additional ulcer patients tested before and after vagotomy and pyloroplasty, only 2 of whom had clinical dumping, the apomorphine test revealed no significant change in dumping disposition. It is concluded that the apomorphine test is valuable in the preoperative prognosis of gastrectomy-induced dumping.

2763 **THE VALUE OF RADIOLOGICAL INVESTIGATIONS OF THE ALIMENTARY TRACT IN CHILDREN WITH THE COELIAC SYNDROME.** *(E.)* Haworth, E. M. (Queen Elizabeth Hosp. Child., London, England), C. J. Hodson, E. M. Pringle and W. F. Young. *Clin Radiol* 19(1):65-76, 1968.

Plain films, flocculating and nonflocculating media were used to evaluate the small bowel of 78 children with gluten intolerance and 42 with malabsorption due to other causes (e.g., protein-losing enteropathy from lympangiectasia, cystic fibrosis, malrotation of the bowel and stagnant-loop syndrome). In all 69 acute and subacute episodes of gluten intolerance the plain films showed dilatation, while only 38 nonflocculating media studies out of 51 performed during such episodes were positive. All 37 studies with flocculating media were abnormal during these episodes. Bowel diameter decreased in all cases and flocculation variably improved as the patient's clinical course improved. The radiological appearance in other malabsorption states was distinguished from gluten intolerance only when anatomical abnormalities were present.

2764 **DESCRIPTION OF A METHOD FOR EVALUATING GASTRO-DUODENO-JEJUNO-ILEAL TRANSIT TIMES OF A TEST MEAL.** *(It.)* Fontana, G. (Inst. Spec. Med. Pathol., U. Bologna, Italy), A. G. Lanfranchi and P. Vezzadini. *Minerva Gastroent* 14(4):205-213, 1968.

A multiway probe (300 cm long and 6 mm in diameter) was introduced p.o. in normal subjects. The 4 ways were situated at the level of the stomach, the third duodenal portion, the proximal jejunum and the ileum. The meal consisted of a balanced composition of proteins, lipids and glucides, to which a radioactive tracer (1 μC albumin ^{51}Cr) and 15 g of polyethylene glycol (PEG) were added to determine the concentration of the meal in the aspirated samples. In 8 normal subjects the average arrival and total transit times of the meal were resp.: 8 and 210 min in duodenum; 11 and 215 min in jejunum; 35 and 183 min in ileum. The average values of intestinal contents evaluated in 5 subjects were: 372 ml in duodenum and 392 ml in jejunum. PEG concentration was 38% in duodenum and 33% in jejunum and analysis of ^{51}Cr ratio showed similar results.

2765 **A TECHNIQUE FOR THE ENZYMATIC DIAGNOSIS OF GLYCOGEN STORAGE DISEASE ON VERY SMALL TISSUE SPECIMENS.** *(E.)* Öckerman, P. A. (U. Hosp., Lund, Sweden). *Acta Paediat Scand* 57(2):105-109, 1968.

Methods were developed to utilize very small amounts of liver tissue, as obtainable with a fine needle, for the diagnosis of glycogen storage disease. Using liver biopsy specimens from 7 controls and biopsy and autopsy specimens from 8 cases of

4 different types of glycogen storage disease, analysis of glucose-6-phosphate, phosphorylase, amylo-1,6-glucosidase, α-glucosidase, glycogen and protein on 0.5-2.0 mg fragments of liver tissue were performed. The methods involved incubation of very small volumes, assay of phosphorus by a newly-described, highly sensitive method, and assay of glucose by the hexokinase-glucose-6-phosphate dehydrogenase with fluorimetric measurement of NADPH. Protein and glycogen could be assayed in a more conventional way. The sensitivity of the methods was acceptable for the amount of tissue available from the fine-needle biopsies.

2766 **SINOGRAPHY OF ABDOMINAL STAB WOUNDS.** *(E.)* Trimble, C. (Denver Gen. Hosp., Colo.), M. Pomerantz and B. Eiseman. *Amer J Surg* 117(3): 426-429, 1969.

In 30 patients with abdominal stab wounds, rubber catheters were inserted through the wounds under sterile conditions and 50 cc of 60% Renografin (meglumine diatrizoate) were injected in order to visualize peritoneal penetration. Multiple X-ray views revealed 8 cases of penetration (7 of which were later confirmed by laparotomy) and 22 negative cases; among the latter, 8 were nevertheless subjected to laparotomy, which confirmed the sinographic findings in 4 cases and revealed 4 false-negatives.

2767 **ELECTROMYOGRAPHIC STUDY OF GASTRIC MOTILITY IN CONSCIOUS SHEEP.** *(Fr.)* Ruckebush, Y. (Inst. Natl. Sci. Appl. Lyon, France) and J. P. Laplace. *C R Soc Biol (Paris)* 161(7):1581-1588, 1967.

Gastric motility was studied in 4 sheep and 2 lambs by recording the electric activity of different points in the rumen, reticulum, omasum or abomasum. Records of electric activity in the reticulum and in the rumen during consecutive ruminations confirmed the classical phenomena of acceleration in the frequency of extrinsic contractions, and the elevation of the basal tone of the rumen-reticulum pouch during eating. A direct correlation was found between abomasum motility and evacuation of omasum content. On this basis it seems that the end of a period of rumination is concomitant with the repletion of omasum, and eating increases gastrojejunal transit.

2768 **FUNDAMENTAL STUDIES ON THE DIAGNOSIS OF EARLY GASTRIC CANCER–ESPECIALLY ON THE OPTIMUM PHOTOGRAPHIC CONDITIONS FOR GASTROENDOSCOPY AND X-RAY.** *(Jap.)* Tasaka, S. (Atami Natl. Hosp., Shizuoka, Japan), Y. Oguro and T. Sakita. *Iryo* 21(8):919-931, 1967.

In the detection of early gastric cancer, excellent resolution is required to distinguish a minute lesion and accurate color for discrimination of the lesions. Resolution has been studied and evaluated using a disordered circle of Siemens' test chart. A focusing fiberscope is best for detailed observations. In general, the resolution of gastroendoscopic instruments is superior to X-ray, but combinations of the 2 should be used even in routine gastric examinations. The light-volume of a gastrocamera should be checked periodically. High speed photography is useful clinically; a gastric ulcer was photographed most sharply at a speed of 1/60 sec while an early gastric cancer was delineated with the best color discrimination at a speed of 1/30 sec. Films for gastrocameras were evaluated.

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Liver biopsies were performed using the Menghini technique on 1300 inpatients and 300 outpatients. Latent hepatitis may be revealed by biopsy. Confusing X-ray findings may be clarified and unnecessary hospitalization prevented. Steatosis and hepatic siderosis may be discovered. In a surprising percentage of diabetics a fatty liver was disclosed by biopsy and serious liver involvement prevented by proper diet and abstinence from alcohol. Latent cirrhosis was diagnosed by biopsy in the absence of laboratory findings. An unnecessary exploratory laparotomy may also be prevented.

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See also: 2627,2679,2681,2682,2691,2692,2703,2869,2870,2910,2913,2918,2956,2961,3131,3147,3153,3166,3171,3172, 3215,3233,3235,3239,3259,3283,3306,3307

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ESOPHAGUS

2862 CORROSIVE ESOPHAGITIS. *(E.)* Daly, J. F. (New York U. Sch. Med., N. Y.). *Otolaryng Clin N Amer* (June):119-131, 1968.

Ninety-six of 105 patients with corrosive esophagitis were followed adequately to allow evaluation of a regimen which included: initial esophagascopy; no oral feeding; passage of a nasogastric polyethylene tube for feeding and for lumen preservation; systemic steroids and antibiotics until esophagus is healed. Four of the 105 died of complications. Of the 96 patients, steroid therapy reactivated gastric ulcers in 3, and passage of the esophagoscope through the burnt area resulted in 3 perforations. Of 54 patients with mild ulcerative esophagitis, healing was complete without strictures within 28 days. Of 47 with severe damage, there were 2 strictures; only 5 patients required 120 to 165 days for healing. Of 7 patients with severe ulcerative esophagitis and complications, 4 died early in therapy and 3 developed strictures.

2863 TRAUMATIC DIAPHRAGMATIC HERNIA. *(E.)* Cole, W. R. (Royal Perth Hosp., Australia). *Aust Radiol* 12(2):107-117, 1968.

The radiological features of 10 cases (7 men and 3 women; 18-57 yr) of traumatic diaphragmatic hernia are presented. Of 7 cases of left-sided rupture, the stomach had herniated in 6 and was the most common structure to do so. In one case it was the only abdominal organ above the diaphragm. The spleen and colon had herniated in 3 cases. The spleen was lacerated and herniated in one case, and lacerated without herniation in another. Omentum was found in the hernia in 3 cases. On the right side, the radiological appearances of herniation were more difficult to appreciate when the liver was the only abdominal organ herniated or lacerated, and the diagnosis tended to be delayed or discovered only at operation. All cases were successfully operated on, the majority shortly after their initial admission. In only 2 cases was there an interval of several years before operation.

2864 THE PHARYNGOESOPHAGEAL SPHINCTER. *(E.)* Zaino, C. (Montefiore Hosp., Bronx, N. Y.), H. G. Jacobson, H. Lepow and C. Ozturk. *Radiology* 89(4): 639-645, 1967.

A 1-2 cm segment of esophagus located below the level of the lower pole of the cricoid cartilage was studied in 70 specimens from adults ranging in age from 10 to 88 yr, and 30 specimens from infants ranging from a 3 1/2-month embryo to 1 yr old. Of the 70 adult specimens 67 were dissected, 65 had roentgen studies, 12 had cast impressions of the area and 3 were used exclusively for histologic study, as were the 30 infant specimens. The cricopharyngeal musculature was quite variable. In 60% of the adult specimens the area at the lower pole of the cricoid cartilage and cricopharangeus was narrowed and this portion of the esophagus showed coarse circular muscle bundles with an increased number of Auerbach plexuses and ganglion cells. Roentgen studies confirmed the presence of the sphincter zone.

2865 ACHALASIA OF THE CARDIA: PHARMACOLOGY AND HISTOPATHOLOGY OF ISOLATED CARDIAC SPHINCTERIC MUSCLE FROM PATIENTS WITH AND WITHOUT ACHALASIA. *(E.)* Misiewicz, J. J. (Cent. Middlesex Hosp., London, England), S. L. Waller, P. P. Anthony and J. W. P. Gummer. *Quart J Med* 38(149):17-30, 1969.

Muscle strips from the cardiac sphincters of 16 patients with and 13 without achalasia were exposed to various pharmacologic agents in a physiologic bath. In the control group, the relaxation produced by nicotine in the circular muscle was blocked by hexamethonium, bretylium, pronethalol and phentolamine but not by Hydergine or physostigmine. Norepinephrine produced a variable result which was abolished by α-adrenergic blocking agents. The relaxation caused by isoprenaline was abolished by β-adrenergic blocking agents. The histamine response was biphasic. Cholinergic contractile activity and β-adrenergic relaxation are normally present in the longitudinal layer. β-Adrenergic inhibitory innervation in both muscle layers is lost in achalasia and ganglion cells are almost entirely lacking. The myenteric plexus is fibrosed and infiltrated by lymphocytes.

2866 HODGKIN'S DISEASE OF THE OESOPHAGUS. *(E.)* Hambly, C. K. (Sydney Hosp., Australia) and J. E. Blundell. *Aust Radiol* 12(1):43-48, 1968.

Less than 20 cases of Hodgkin's disease of the esophagus were found in a literature review and 3 patients (2 female, 1 male), from a 17-yr survey of 205 patients with Hodgkin's disease, were noted to have esophageal involvement. All 3 were under 32 yr of age when initially diagnosed, had survived at least 7 yr with the disease, had presented with supraclavicular nodes and a mediastinal mass, required several X-ray treatments to the involved areas, and had suggested esophageal involvement through dysphagia. Radiologic evidence of a nonspecific esophageal constriction was present in each. Histologic evidence was lacking in one patient in whom esophagoscopy and later permission for an autopsy were refused.

2867 ANALYSIS OF 266 HIATUS HERNIA OPERATIONS BY HUSFELDT'S METHOD, COMPARED TO 134 TRANSTHORACIC OPERATIONS AND 140 GASTROPEXIES. *(E.)* Harjola, P.-T. (U. Cent. Hosp., Helsinki, Finland), P. Tala, P. Ketonen and E. Uramo. *Ann Chir Gynaec Fenn* 56(3):286-290, 1967.

The average follow-up period for the 266 hiatus hernia patients was 21 months (range of 6-44 months). Most patients attended a follow-up examination and some responded to a questionnaire. In the interim, 6 patients had died and 13 were lost to follow-up; therefore, the follow-up series consisted of 247 patients. The patients whose status was good or improved, numbered 237 (89.1%). Among those whose status was unimproved, 9 (3.4%) were recidivists and reoperation was undertaken. (Three of these 9 were at last report in good health, 4 were improved, 1 was unchanged, and 1 had another recurrence of hernia.) When the results of this series of 266 were compared with those of 134 transthoracic operations and 140 gastropexies, it was found that the recidivation frequency was lowest (3.4%) with the transabdominal approach (Husfeldt's method), 18.7% with transthoracal reconstruction, and 7.1% with gastropexy. The mortality following the use of Husfeldt's method was slightly lower than after transthoracic operation, and slightly higher than after gastropexy.

2868 **SPONTANEOUS RUPTURE OF ESOPHAGUS (BOERHAAVE'S SYNDROME).** *(It.)* Prior, A. (Inst. Pathol. Spec. Chir., U. Genoa, Italy). *Omnia Med* 66(4): 329-838, 1968.

Spontaneous rupture of the esophagus occurs in males 40-60 yr old (80%); the lesion is generally longitudinal, 1-8 cm long, and in the lower 3rd of the esophagus. It appears during violent vomiting or defecation. The clinical picture is characerized by epigastric or retrosternal pain, shock, hypertensive pneumothorax, subcutaneous emphysema. X-ray is essential n diagnosis, when rupture is suspected. Drainage of the mediastinum and of the pleural cavity and direct repair of the esophageal rupture, after thoracotomy, are the preferred treatment. The prognosis is always poor: 100% of the patients died as late as 1945, 30-40% recently.

2869 **CYTOLOGY OF THE ESOPHAGUS.** *(E.)* Bernier, L. (Hôtel Dieu de Quebec, Canada) and M. L. Godbout. *Laval Med* 39(1):11-15, 1968.

A study of the cytological findings on 130 specimens from 123 patients showed 98 (75.4%) negative, 6 (4.6%) suspect, 21 (16.1%) positive, and 5 (3.9%) insufficient because of poor or necrotic material. In order to evaluate esophageal cytology, cytological results were compared with the pathological diagnosis when a specimen was available: this was possible in 71 cases (54.6%). (In the remaining 59 cases the gross appearance of the mucosa did not justify a biopsy). In 42 cases with negative cytology 37 were negative pathologically and 5 showed carcinoma. The 21 cases with a positive cytology all were confirmed as positive by the pathology. Among 5 suspect cases at cytology, 2 were negative and 3 were positive at histology. In 3 with insufficient cytology, pathology was negative in 2 and positive in 1. In summary of the cytology versus pathology, the former showed the following results: no false positive, 5 false negatives and 1 case of carcinoma. Details of the 5 cases are given.

2870 **HIATUS HERNIA: ITS RADIOLOGICAL DIAGNOSIS.** *(Sp.)* Valencia-Parparcen, J. (Fac. Med., Cent. U., Venezuela, Caracas), V. T. Lecuna and G. D'Escrivan. *GEN* 23(2):157-178, 1968.

Esophageal examinations were performed on 1027 of 3500 consecutive patients. Results were normal in 728 (70.8%) and pathological in 299 (29.2%). Of the 299 patients with esophageal pathology 243 (81.3%) had some form of hiatal pathology: 207 hiatus hernia (69.2%), (172 grade I, 30 grade II, 30 grade III) and 36 ruptured hiatus (12.1%). Of the 207 hiatus hernias, 128 (61.8%) were in men and 79 (38.2%) in women. Only 43 of the 207 patients were between 21 and 40 yr of age, 123 were 41 to 60 yr and 41 over 60 yr; 79.2% were over 40 yr of age. Radiological studies were made of 317 patients: 200 with normal esophagus, 62 with hiatus hernia grade I, 44 with grade II, 9 with grade III and 2 with grade IV, 317 in all. The findings included the following: The phrenic ampule decreases in length and increases in diameter when there is hiatus hernia. In normal patients the esophageal sphincter is difficult to visualize. The distance between the diaphragm and the lower esophageal sphincter increases with the degree of herniation. Esophageal irritability is present in a high percentage of cases with hiatus hernia, but is infrequent (8.5%) in normal esophagus. Although the submerged segment is evident in the majority of normal cases (85%) it disappears in cases of hiatus hernia and is replaced by a false submerged segment corresponding to an intrahiatal gastric mucosa. In grade I hiatus hernia the vestibule can be visualized in 87% of the cases.

2871 **RADIATION THERAPY OF ESOPHAGEAL CANCER AND ITS RESULTS.** *(E.)* Voutilainen, A. (U. Cent. Hosp., Helsinki, Finland) and M. Koulumies. *Ann Chir Gynaec Fenn* 56(2):126-129, 1967.

Between July 1, 1962 and the end of 1964, 162 patients with esophageal cancer were treated: 12 were given X-ray (230 kV) treatment, 84 telecobalt, 44 X-ray of betatron 33 MeV, and 22 were not treated because of their poor general condition. There were 77 men and 85 women in the series; the mean age of the men and women was 60 and 74.5 yr, resp. The radiotherapy follow-up period was 2 yr for 162 patients and 3 yr for 86. One of the 12 patients treated by X-ray has survived over 3 yr and is still asymptomatic. Of 84 patients treated by telecobalt, 21 (25%) survived 1 yr, 6 (7%) survived 2 yr and none survived 3 yr. Of the 44 patients treated by betatron X-ray, 17 (39%) survived 1 yr, 17 (23%) survived 2 yr, and 3 survived 3 yr. The therapeutic results with betatron X-ray were the best, whether fixed field or pendulum therapy was used.

2872 **REFLUX ESOPHAGITIS AFTER SOME OPERATIONS ON THE CARDIA AND ESOPHAGUS.** *(Rus.)* Kharitonov, L. G. *Khirurgiia (Moskva)* 45(2):18-21, 1969.

2873 **CARDIOSPASM.** *(Dan.)* Moller, H. J. (Comm. Hosp., U. Aarhus, Denmark). *Ugeskr Laeg* 131(4):139-141, 1969.

2874 **DIAPHRAGM HERNIA IN ADULTS. SURGICAL AND CLINICAL CONSIDERATIONS.** *(Sp.)* Loyarte, H. F. (Mar del Plata Hosp., Argentina) and C. A. Cavagnaro. *Rev Esp Enferm Apar Dig* 28(2):227-240, 1969.

2875 **ANATOMICAL AND PHYSIOLOGICAL MECHANISMS OF THE CARDIAC SPHINCTER AND DISTURBANCES CONNECTED WITH HIATUS HERNIA.** *(Sp.)* Pi-Figueras, J. *Rev Esp Enferm Apar Dig* 28(2):219-226, 1969.

2876 **ESOPHAGEAL RECONSTRUCTION - COLON TRANSPLANT - IN TWO BROTHERS WITH EPIDERMOLYSIS BULLOSA.** *(E.)* Absolon, K. B. (Northwest Texas Hosp., Amarillo, Tex.), L. A. Finney, G. M. Waddill Jr. and C. Hatchett. *Surgery* 65(5):832-836, 1969.

2877 **ESOPHAGEAL ATRESIA.** *(E.)* Neuhauser, E. B. D. (Child. Hosp. Med. Ctr., Boston, Mass.). *Postgrad Med* 45(5):67-69, 1969.

2878 **ESOPHAGEAL INJURY BY LIQUID CHLORINE BLEACH: EXPERIMENTAL STUDY.** *(E.)* Weeks, R. S. (Dept. Surg., U. Chicago, Ill.) and M. M. Ravitch. *J Pediat* 74(6):911-916, 1969.

2879 **CARDIOSPASM: A RARE COMPLICATION AFTER SELECTIVE VAGOTOMY.** *(Fr.)* Dahm, K. (Marien Hosp., Hamburg, Germany). *Acta Gastroent Belg* 31(12):883-888, 1968.

2880 **DYSPHAGIA AFTER SUB-DIAPHRAGMATIC VAGOTOMY.** *(Fr.)* Adloff, M. (U. Hosp. Ctr., Strasbourg, France), J. J. Kohler and A. G. Weiss. *Acta Gastroent Belg* 31(12):873-882, 1968.

2881 **A RARE COMPLICATION OF PRETHORACIC ESOPHAGOJEJUNOSTOMY.** *(It.)* Alfano, C. (Inst. Gen. Surg. Clin., U. Naples, Italy) and A. Ciardiello. *Rass Int Clin Ter* 48(21):1322-1329, 1968.

2882 **DEMONSTRATION OF OESOPHAGEAL REFLUX USING LIVE SNAKES.** *(E.)* Johnson, A. C. (Christian Med. Coll. Hosp., Vellore, India) and S. Johnson. *Clin Radiol* 20(1):107-109, 1969.

2883 **RADIATION THERAPY IN CANCER OF THE ESOPHAGUS.** *(E.)* Takaoka, A. (Kyoto Prefectural U. Med., Japan), M. Maeda, M. Urano, S. Kikkawa, H. Orisaka, Y. Nakatani and M. Hasegawa. *Nippon Acta Radiol* 27(12):1607-1621, 1968.

2884 **FOREIGN BODIES IN THE ESOPHAGUS.** *(E.)* Vettath, J. K. (Christian Med. Coll. Hosp., Ludhiana, India), A. S. Sandhu, S. K. Sharma, C. M. Singh and F. C. Eggleston. *Punjab Med J* 18(5):190-192, 1968.

2885 **BLEEDING OESOPHAGEAL VARICES.** *(E.)* Williams, R. *Postgrad Med J* 45(521):230-232, 1969.

2886 **ACUTE CORROSIVE OESOPHAGITIS.** *(E.)* Dafoe, C. S. (Edmonton, Alberta, Canada) and C. A. Ross. *Thorax* 24(3):291-294, 1969.

2887 **VASCULAR ANOMALIES COMPRESSING THE OESOPHAGUS AND TRACHEA.** *(E.)* Lincoln, J. C. R. (Hosp. Sick Child., London, England), P. B. Deverall, J. Stark, E. Aberdeen and D. J. Waterston. *Thorax* 24(3):295-306, 1969.

2888 **SPONTANEOUS ESOPHAGEAL RUPTURE.** *(It.)* Tassini, T. (Munic. Hosp., Udine, Italy). *Friuli Med* 23(2):243-256, 1968.

2889 **ESOPHAGEAL DIVERTICULA.** *(Sp.)* Nasio, J. *Galicia Clin* 41(1):44-59, 1969.

2890 **CARCINOGEN IN A TRANSKEIAN BANTU FOOD ADDITIVE.** *(E.)* DuPlessis, L. S. (Rhodes U., Grahamstown, S. Africa), J. R. Nunn and W. A. Roach. *Nature* 222(5199):1198-1199, 1969.

2891 **CARCINOSARCOMA OF THE ESOPHAGUS. [CASE REPORT]** *(E.)* Bardenheier, J. A. (St. Louis U., Mo.) and R. R. Maginn. *Missouri Med* 66(6):421-426, 1969.

2892 **FISTULIZATION BETWEEN THE ESOPHAGUS, AORTA, AND TRACHEA AS A COMPLICATION OF ACUTE CORROSIVE ESOPHAGITIS: REPORT OF A CASE.** *(E.)* McCabe, R. E. Jr. (St. Luke's Hosp. Ctr., New York, N. Y.), J. R. Scott and M. G. Knox. *Amer Surg* 35(6):450-454, 1969.

2893 **SUBMUCOSAL PERFORATION OF THE ESOPHAGUS IN THE NEONATE.** *(E.)* Eklof, O. (Karolinska Inst., Stockholm, Sweden), G. Lohr and L. Okmian. *Acta Radiol* 8(2):187-192, 1969.

2894 **CERVICAL ESOPHAGEAL DIVERTICULA CAUSING COMPLETE OBSTRUCTION.** *(E.)* Polk, J. W. (Missouri State Sanatorium, Mt. Vernon), M. Medina and E. Sarno. *Eye Ear Nose Throat Monthly* 48(4):251-254, 1969.

2895 **A NEW TECHNIQUE FOR THE REPAIR OF TRAUMATIC DIAPHRAGMATIC HERNIA USING POLYPROPYLENE MESH.** *(E.)* Brady, M. P. St. Vincent's Hosp., Dublin, Ireland), P. Farrell and P. A. Fitzgerald. *J Irish Med Ass* 61(370):142-143, 1969.

2896 **TREATMENT OF CARCINOMA OF THE ESOPHAGUS AND LUNG WITH CONCENTRATED RADIATION FOLLOWED BY SURGERY.** *(E.)* Groves, L. K. (Cleveland Clin. Found., Ohio) and A. Rodríguez-Antúnez. *Ann Thorac Surg* 6(2):154-162, 1968.

2897 **COMPRESSION OF THE OESOPHAGUS BY THE AORTA.** *(E.)* McMillan, I. K. R. (Southampton Chest Hosp., England) and I. Hyde. *Thorax* 24(1):32-38, 1969.

See also: 2638,2759,2761,2779,2804,2822,2954,3006,3071

STOMACH

(Gastric ulcer is placed with peptic ulcer)

898 **CHRONIC GASTRITIS AND THE MEDICAL HISTORY: A CONTRIBUTION TO THE ETIOLOGY OF CHRONIC GASTRITIS.** *(Ger.)* Wolff, G. (Inst. Cancer Res., German Acad. Sci., Berlin, Germany). *Munchen Med Wschr* 111(15):854-859, 1969.

Gastric biopsies were performed on 1006 unselected patients (all over 50 yr of age) who were then interviewed in a retrospective study of the incidence of other diseases in relation to chronic gastritis. The subjects included 301 healthy controls, 257 with malignant tumors (not including stomach cancer), 247 with upper abdominal symptoms not due to ulcer, 108 with recently detected diabetes, and 93 others. Statistical analysis revealed no relation between the incidence of histologically-proven gastritis and a previous history of hepatitis, diph-heria, scarlet fever, syphilis, pneumonia, pleuritis, tuberculosis, parasitic infestation or dystrophy. Patients with a history of kidney stones had a lower incidence of gastritis than the average, but miscarriages and a history of nonspecific gastric complaints occurred more often in patients found to have chronic gastritis.

899 **THE PROTECTIVE EFFECT ON THE STOMACH OF A NEW DRUG (XYLAMIDE) FOR THE GASTRIC DISORDERS RESULTING FROM ADMINISTRATION OF CORTICOSTEROIDS.** *(Sp.)* Gobbi, F. (Inst. Spec. Med. Path., U. Modena, Italy). *Medicina (Mex)* 49(1054):124-128, 1969.

Among 11 patients with gastric symptoms due to prolonged corticosteroid therapy (prednisone, betamethasone) for Hodgkin's disease or other hematological or malignant conditions, treatment with xylamide (400 mg p.o. 3 times daily for 5-15 days) markedly decreased the uropepsinogen excretion. This decrease was accompanied by disappearance of abdominal pain, and persisted despite withdrawal of xylamide and continued administration of corticosteroids. Control studies also showed that administration of corticosteroids resulted in a sharp increase in uropepsinogen excretion. No significant variation in uropepsinogen excretion was obtained with xylamide, however, in 8 male volunteers who had not been treated with corticosteroids and had no gastric symptoms.

2900 **SOME PRINCIPLES AND RESULTS OF SURGERY FOR CANCER OF THE STOMACH.** *(Rus.)* Lur'ie, A. S. (Sci.-Res. Inst. Surg., Moscow, USSR). *Khirurgiia (Moskva)* 44(11):9-15, 1968.

During a 20-yr period, 1018 radical operations were performed for cancer of the stomach (84.3% stage III and 7.4% stage IV), including 454 subtotal resections of the distal stomach, 346 total gastrectomies, and 217 proximal gastric resections. During subtotal distal resection and total gastrectomy for cancer involving the lesser curvature, the lymph nodes along the common hepatic artery were resected *en bloc*. The postoperative mortality in the 3 groups was 6.16%, 18.2% and 14.27%, resp. The 5-yr survival was 42.3% among 421 patients followed up after subtotal distal gastrectomy, 30.4% among 273 patients followed up after total gastrectomy, 25.5% among 176 patients followed up after proximal resection, and 25.47% among 90 patients subjected to combined gastric resection and extirpation of parts of the liver, large intestine or pancreas. The most common histological type was adenocarcinoma (561 cases), but the 5-yr survival was highest (42-45.5%) in patients with solid and undifferentiated carcinomas, followed by those with mucous, small-cell or adenocarcinoma (31-37.7%); the 5-yr survival among patients with scirrhous cancer was only 17.3%.

2901 **GASTRECTOMY–A REEVALUATION.** *(E.)* Roesel, R. W. (U. Illinois, Sch. Med., Chicago). *Chicago Med* 71(21):805-807, 1968.

One hundred consecutive gastrectomy patients, 57 males and 43 females, were reviewed. In 56 there was a gastric ulcer, in 39 duodena, and in 5 males a marginal ulcer was found. Most (46) were operated on because there was no response to medical therapy. Sixty-eight cases had Billroth I resections, 32 Billroth II, 13 had vagotomies and antrectomies and 9 had Billroth II and vagotomy. In 2 cases the spleen was ruptured and removed at surgery. Duodenal stump drainage occurred in 3 patients, 2 of whom died subsequently, and 4 had pulmonary emboli which were fatal in 2. Fifty patients (43 males and 7 females) having vagotomies and drainage procedures for peptic ulcerations were compared to the gastrectomy group. In the former group there were no deaths and few complications; operating times were shorter but convalescence was the same for uncomplicated cases in both groups.

2902 **EFFECT OF PYRODIFENIUM BROMIDE ON GASTRIC ACTION POTENTIALS OF MAN.** *(E.)* Ono, K. (Hirosaki U., Sch. Med., Aomori-ken, Japan), Y. Watanabe, Y. Suzuki, H. Tsuchida, M. Abo, Y. Sugiyama, T. Sugisawa, S. Nozaki, J. Kakizaki, N. Kudo and M. Takeuchi. *Asian Med J* 11(6):437-446, 1968.

Eight patients undergoing laparotomies had bipolar electrodes placed on the wall of their stomachs and small intestines. The electrodes were connected to an amplifier to record action potentials after light food loading and pyrodifenium bromide (PDB) administration to patients 4 days postoperatively. Five patients received 2 mg of PDB i.v. with discharge inhibition beginning 5 min later and normalcy returning in 20-25 min. One patient received 7.5 mg PDB i.m. and in spite of bethanacol chloride administration there was marked diminution of spike discharges from the antrum and sphincter. One patient given 15 mg of PDB p.o. showed diminished spike discharge amplitude in 20 min and the 1 patient given 10 mg PDB p.o. followed by an additional 30 mg p.o. after 35 min showed discharge inhibition 10 and 15 min after ingestion. No side effects were noted in any of the patients.

2903 **THE MORPHOLOGY OF GASTRIC CARCINOMA IN RELATION TO 5-YEAR SURVIVAL.** *(E.)* Urban, A. (Inst. Oncol., Krakow, Poland), J. Oszacki and M. Lenczyk. *Acta Med Pol* 9(4):373-389, 1968.

Among 345 patients subjected to gastrectomy for cancer of the stomach, 43 died immediately after surgery and 70 (23.2%) survived 5 yr or longer. The 5-yr survival rates in the 302 patients who survived the operation were correlated with tumor morphology, with emphasis on: a) type of cancerous infiltration; b) characteristics of the stroma; c) presence of lymph node metastases; and d) depth of infiltration of the gastric wall. A good prognosis can be expected when the tumor is less than 5 cm in diameter, has not produced lymph node metastases or serosal infiltration, and has infiltrated by pushing, leaving the stroma soft.

2904 **INCIDENCE OF MALIGNANT NEOPLASMS OF THE STOMACH IN POLAND AND THE CITY OF WARSAW–MORTALITY FROM NEOPLASMS IN POLAND IN THE YEARS 1962-1964.** *(E.)* Gadomska, H. (Inst. Oncol., Warsaw, Poland), T. Koszarowski and Z. Drożdżewska. *Acta Med Pol* 9(4):359-363, 1968.

In Poland during the period 1962-64, the percentage of registered new cases and deaths from cancer of the stomach in males greatly exceeded that in females, yielding a sex ratio of about 1.9. Gastric cancer was the most common malignancy in males, followed by cancer of the bronchus and lung, skin, lip and hepatobiliary tract, while in females gastric and hepatobiliary cancer were in 3rd and 4th place behind neoplasms of the cervix and breast. In Warsaw, however, lung cancer was somewhat more common than stomach cancer in males. The mean age of newly registered cases of stomach cancer in 1964 was 60.9 yr in men and 62.8 yr in women, while the mean age at death was 63.3 and 66.2 yr, resp. The percentage of registered new cases and mortality rates for both sexes were higher in rural than in urban areas.

2905 **GASTRIC MUCOSA IN GASTRIC RESECTION FOR ULCERS.** *(It.)* Saracco, C. (Inst. Clin. Med. Gen., U. Turin, Italy), F. Balzola and V. Lombardo. *Minerva Gastroent* 14(4):214-219, 1968.

Gastric biopsy was made in 82 patients (22-65 yr old) gastric resectioned between 4 months and 24 yr earlier by means of Debray's probe with radioscopic control. A dolorous dyspeptic symptomatology was found in 67 patients. Histologic examination showed a normal aspect of the mucosa in 21 (25.6%) primarily young subjects, a gastritis in 61 (74.4%) of the patients. Gastritis was classifiable as superficial in 26 (31.7%), preatrophic in 20 (24.4%), and atrophic in 15 (18.3%). Preatrophic and atrophic gastritis were generally found in old patients subjected to gastric resection many years before. Calyciform heterotopia was found in 21.9% patients with inflammatory and regressive alterations. There was no relation between the histologic alteration of the mucosa and the postoperative symptomatology.

2906 **CAROTINEMIA BEHAVIOR IN GASTRIC RESECTIONED PATIENTS.** *(It.)* Pera, A. (Inst. Clin. Med., U. Turin, Italy), S. Gabasio and F. Balzola. *Minerva Gastroent* 14(4):220-223, 1968.

In 100 patients with gastric resection performed 6 months-20 yr earlier, and in 100 normal subjects the percentage of serum carotene was determined. In the controls the average was 2 75 ± 76 µg/100 ml and in all the patients 152 ± 74.61 µg/100 ml, a significant difference from the controls ($P < 0.01$). In 25 patients (25%) the serum level of carotene was lower than 120 µg/100 ml. In the asymptomatic patients the average serum carotene was 198 ± 68.6 µg/100 ml; in the symptomatic patients it was 129 ± 66.94 µg/100 ml. The latter patients were divided into patients with functional diseases (19), who showed an average serum carotene of 184.9 ± 67.6 µg/100 ml; and patients with organic diseases (48) (ulcers, gastritis, stomatitis, gastrointestinal hemorrhage, low body weight, diarrhea and steatorrhea) who showed an average serum carotene of 107 ± 52.9 µg/100 ml. It is pointed out that while in the subjects with organic diseases excepting steatorrhea the average serum carotene was 117.31 ± 51.9 µg/100 ml, in the subjects with steatorrhea the average was 69.6 ± 38.84 µg/100 ml. It is concluded that this test is useful to demonstrate alterations in nutrition.

2907 **PREOPERATIVE IRRADIATION WITH BETATRON ELECTRON BEAM IN GASTRIC CANCER.** *(Jap.)* Amino, S. (Tokyo Med. Coll., Japan), K. Umeda, K. Abe, H. Nishio, T. Niwa, A. Sakurai, T. Ishizuka, S. Suzuki and S. Okamoto. *Nippon Acta Radiol* 28(5):546-557, 1968.

Betatron electron beam preoperative irradiation (24-26 MEV) was performed on 48 patients with gastric cancer, 16 of whom were irradiated in combination with 5-FU, a radiosensitizer. As a result of the betatron irradiation, a marked improvement was noted in the rate of resection (70.4%). Endoscopic and histologic examination revealed only mild general disturbance due to the irradiation. In the 16 cases that received the combined treatment with the 5-FU, one-half to two-thirds of the irradiation dose was sufficient to produce similar results.

2908 **SEROTONIN AND BRADYKININ IN THE DUMPING SYNDROME.** *(E.)* MacDonald, J. M. (U. Pittsburgh Hlth. Ctr. Hosp., Pa.), M. M. Webster Jr., C. H. Tennyson and T. Drapanas. *Amer J Surg* 117(2):204-213, 1969.

In 32 healthy adult mongrel dogs weighing 10-25 kg, catheters were placed in the splenic vein, splenic or femoral artery, and distal duodenum and samples of portal and arterial blood were obtained before, during and after the instillation of 150 cc of 50% glucose into the duodenum. Serial spectrofluorometric analyses and bioassays of serotonin, bradykinin and bradykininogen from both circulations and of arterial p-tosyl-L-arginine methyl ester (TAME) esterase showed that serotonin values began to rise within 15 min, reaching maxima 101-116% above portal and arterial control values. Arterial TAME esterase rose immediately following glucose instillation, as did portal and arterial bradykinin; the latter 2 parameters reached peaks 37 and 33% above controls, resp. Portal and arterial bradykininogen demonstrated an immediate decline, to minima 35 and 38% below control values, resp. It is concluded that bradykinin is responsible for the early vasomotor symptoms in the dumping syndrome while serotonin is the cause of the delayed gastrointestinal responses.

2909 **LONG-TERM SURVIVAL (10 TO 56 YEARS) AFTER SURGERY FOR CARCINOMA OF THE STOMACH.** *(E.)* Remine, W. H. (Mayo Clin., Rochester, Minn.), M. M. R. Gomes and M. B. Dockerty. *Amer J Surg* 117(2):177-184, 1969.

Among 4586 patients who underwent curative surgery for carcinoma of the stomach during the period 1907-55, 1067 survived 10 yr or longer and 957 of these (696 men and 261 women, 26-82 yr old at surgery) had adenocarcinomas. Of these patients, 68 had a palpable preoperative mass and a large proportion had lesions in the lower half of the stomach; 904 of the lesions were smaller than 10 cm. Of the 957 patients, 285 had half or less of their stomachs removed, 505 had three fourths or more removed, 17 had complete gastrectomies and 150 had indeterminate amounts removed. Some free acid was present in 434 patients and 375 were achlorhydric. Symptoms had been present for one year or longer in 497 patients, microscopic invasion of the serosa was seen in 380, and 281 had lymph node involvement. Grade III or IV adenocarcinoma was found in 480 of the patients. Survival curves were similar after 10 yr regardless of nodal involvement, the microscopic grade of the lesion or preoperative diagnosis. They paralleled those in the normal population adjusted for age and sex.

2910 A COMPARATIVE STUDY ON PHASE MICROSCOPIC AND STAIN FINDINGS OF EXFOLIATED GASTRIC CANCER CELLS (A PRELIMINARY REPORT). *(E.)* Tamura, H. (Ctr. Adult Dis., Osaka, Japan), S. Nakano and Y. Watanabe. *Ann Rpt Center Adult Dis* 7(1):59-63, 1967.

The materials used were fresh exfoliated gastric cancer cells obtained by gastrofiberscopic biopsy or during surgery. Phase microscopy proved useful in studying the constituents of the cytoplasm. Under phase microscopy the cytoplasm of exfoliated gastric cancer cells had a granular appearance consisting of large and small constituents with high and low optical densities. Under microscopy the cytoplasm of the same cells with Giemsa staining had a foamy appearance as though consisting of small vacuoles.

2911 GASTRIC POLYPOSIS SIMULATED BY FOREIGN BODIES OF ALIMENTARY ORIGIN. *(It.)* Bernardi, P. (Inst. Clin. Chir. Gen., U. Bologna, Italy) and L. Zanella. *Arch Ital Mal Appar Dig* 35(1):63-70, 1968.

An unusual case report is presented for a female, 58 yr old, affected by severe epigastric pain, with posterior radiation, and with acid vomitus. On the basis of radiology, the diagnosis was diffuse gastric polyposis with pyloric stenosis. At operation, instead of polyposis, about 50 cherry seeds and plum stones were found. These seeds, normally easily eliminated, accumulated in the stomach, since it was impossibile for them to pass through the abnormal pylorum. The use of Trendelemburg's position during radiologic examination of the stomach for a differential diagnosis is stressed.

2912 PRESSURE INJURY TO THE GASTRIC MUCOSA. STUDIES ON AN *IN VIVO* MODEL OF ACUTE GASTRIC DILATATION. *(E.)* Bulkley, G. (Harvard Med. Sch., Boston, Mass.), H. Goldman and W. Silen. *Amer J Surg* 117(2):193-203, 1969.

The roles of elevated transmural pressure and intraluminal acidity in the production of gastric injury were studied in 57 rabbits with isolated stomachs having intact blood and nerve supply. Bleeding rates, pathologic changes, and alterations in the net fluxes of H^+, Na^+, K^+ and Cl^- across the gastric mucosa were observed and compared with those induced by acid and acetylsalicylic acid. The combination of acetylsalicylic acid and acid within the lumen produced slight bleeding and a pattern of widespread but superficial ulceration. Large increases in the net efflux of H^+ and Cl^- from the lumen were associated with marked increases in Na^+ and K^+ influx. High transmural pressure without intraluminal acidity produced a pathological picture of subepithelial hemorrhage and edema without ulceration. A small but significant decrease in the net movement of Na^+ into the lumen was observed, but there were no significant changes in the net fluxes of the other ions measured. There was no appreciable bleeding into the lumen. The combination of intraluminal acidity and 30 cm H_2O transmural pressure produced gross bleeding and deep, confluent, hemorrhagic ulcers, occasionally associated with transmural infarctions. A significantly increased efflux of H^+ from the lumen was observed in association with marginal changes in K^+ and Cl^- fluxes. There was no change in net Na^+ influx. A transmural pressure of 20 cm H_2O in the presence of acid produced slighter changes of the same kind. None of the ion flux changes produced by pressure was as large as those observed in association with acetylsalicylic acid.

2913 CLINICAL ENDOSCOPIC OBSERVATIONS OF GASTRIC ACID SECRETION. *(E.)* Okuda, S. (Ctr. Adult Dis., Osaka, Japan), T. Saegusa, H. Inui and N. Senda. *Ann Rpt Center Adult Dis* 7(1):53-58, 1967.

Using a method for the determination of the extent of functioning fundal mucosa in the stomach, 4 normal humans, 8 cases of gastritis, 22 of chronic ulcer and scar of the corpus, 2 of gastric polyp, and 14 of gastric cancer (50 cases in all) were studied. Three patterns of acid secreting area were classified: Pattern A, with an apparently normal fundus-antrum border clearly defined; Pattern B, with the fundus-antrum border partially defined; and Pattern C, without an acid-secreting area. All normal patients showed Pattern A. In various lesions, Pattern B was more frequently observed than Pattern A or C. The patterns show a parallel relationship with acidity: 83% of the Pattern A cases had hyper- or normoacidity; 55% Pattern B cases and all Pattern C cases show hypo- or anacidity. When comparisons of gastric acid secretion were made between cases of gastric cancer and ulcer, it was found that 12 cases of gastric ulcer and 10 cases of scarred ulcer in the corpus had a comparatively wide mucosal area surrounding the lesion which showed no acid secretion. Conversely, in 8 of 14 cases of malignancy, (6 of 11 cases of type IIc lesion, 2 of 3 cases of Borrmann II type lesion) the acid secreting area was well defined on the mucosa margin surrounding the lesion. In the third case of Borrmann II type cancer acid secretion showed on the entire mucosa surrounding the lesion. Histological examinations were made of 17 cases (14 cancer, 2 ulcer, and 1 gastritis). In 8 cases of cancer of the corpus the well defined acid secreting area adjacent to the mucous cancerous lesion was proven to be fundus gland mucosa without inflammatory changes. The remainder of the cancer cases (6 of 14) showed histological evidence of inflammatory changes. Histological examinations of 11 ulcer patients whose acid secretion had not been endoscopically examined showed no fundus glands in the neighborhood of the ulcer but wide-spread inflammatory changes in the fundus gland mucosa.

2914 NEW FINDINGS IN THE FIELD OF ENZYME TREATMENT OF STOMACH AND INTESTINAL DISEASES. *(Por.)* De Barbieri, A. (Inst. Serum Ther., Milan, Italy). *Rev Brasil Med* 25(10):655-663, 1968.

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2915 EMPHYSEMATOUS GASTRITIS SECONDARY TO LYE INGESTION. REPORT OF A CASE. *(E.)* Clearfield, H. R. (Episcopal Hosp., Philadelphia, Pa.)., Y. H. Shin and B. K. Schreibman. *Amer J Dig Dis* 14(3):195-199, 1969.

2916 DUPLICATION OF THE STOMACH RESEMBLING HYPERTROPHIC PYLORIC STENOSIS. *(E.)* Kammerer, G. T. (Mills Mem. Hosp., San Mateo, Calif.). *JAMA* 207(11):2101-2102, 1969.

2917 PYLORIC DIAPHRAGM IN AN ADULT. [CASE REPORT] *(E.)* Shartsis, J. M. (Henry Ford Hosp., Detroit, Mich.) and T. A. Fox. *Gastroenterology* 56(3):580-582, 1969.

2918 CONSIDERATIONS IN DIAGNOSING GASTRIC SARCOMA. *(Rum.)* Jocu, I. (I. Cantacuzino Hosp., Bucharest, Romania) and E. Ilie. *Med Intern (Bucur)* 21(1):11-20, 1969.

2919 QUESTIONS ON GASTROLOGY. *(Fr.)* Chene, P. *Gaz Med* 76(5):939-944, 1969.

2920 CARCINOMA AND GLOMUS OF THE STOMACH. *(Rus.)* Chistov, A. P. (Shakhov Railroad Hosp., Gorky, USSR). *Arkh Pat* 30(12):54-56, 1968.

2921 DEVELOPMENT OF A GASTRIC CARCINOID WITH HEPATIC METASTASES. *(Fr.)* Lapeyrere, J. (Toulouse, France), P. Davidovitch and G. Moreau. *Arch Mal Appar Dig* 57(11):925-932, 1968.

2922 LIPOSARCOMA OF STOMACH: REPORT OF A CASE. *(E.)* Orita, K. (Okayama U. Med. Sch., Japan), Y. Kokumai, K. Kawada, T. Kawahara and S. Takagi. *Acta Med Okayama* 22(3):167-173, 1969.

2923 STUDIES ON THE SYNTHESIS OF CARCINOGENIC NITROSAMINES IN THE STOMACH. *(Ger.)* Sander, J. (Hyg. Inst., U. Tübingen, Germany), F. Schweinsberg and H. P. Menz. *Hoppe Seyler Z Physiol Chem* 349(12):1691-1697, 1968.

2924 TREATMENT AND PREVENTION OF ACUTE GASTROPLEGIA AFTER VAGOTOMY. *(Fr.)* Henrion, C. (92 Rue de Caraman, Boussu, Belgium). *Acta Gastroent Belg* 31(12):892-905, 1968.

2925 THE VALUE OF TEMPORARY DRAINAGE GASTROSTOMY IMMEDIATELY AFTER DOUBLE VAGOTOMY FOR DUODENAL ULCER. *(Fr.)* Jung, A. (St. Blandine Hosp., Metz, France) and F. Jung. *Acta Gastroent Belg* 31(12):889-891, 1968.

2926 HEMIGASTRECTOMY COMBINED WITH BILATERAL SELECTIVE VAGOTOMY: MODIFICATION OF A PERSONAL TECHNIQUE. *(Sp.)* Narbona Arnau, B. (Prov. Hosp., Valencia, Spain). *Cir Ginec Urol* 22(5):578-584, 1968.

2927 A PSYCHOSIS IN THE FORM OF A COMPLEX DELIRIUM AND BLACK-OUT IN THE COURSE OF DECOMPENSATED STRICTURE OF THE PYLORUS. *(Pol.)* Kopylow, A. (2nd Clin. Intern. Dis., Pomeranian Acad. Med., Szczecin, Poland) and K. Synoradzka. *Wiad Lek* 21(21):1967-1972, 1968.

2928 SURGERY IN GASTRIC BURNS. *(Rus.)* Shoniya, L. F. (Tiflis State Inst. Postgrad Med., USSR). *Khirurgiia (Moskva)* 45(1):112-113, 1969.

2929 TAMPONADE OF THE DUODENUM STUMP WITH THE OMENTUM ON A PEDICLE IN GASTRIC RESECTIONS. *(Rus.)* Gutnik, G. P. (Ukrainian Inst. Postgrad. Med., USSR). *Khirurgiia (Moskva)* 45(1):110-112, 1969.

2930 CONTRIBUTION TO THE STUDY OF GASTRIC NEURINOMA. *(It.)* Romano, B. (A. Cardarelli Hosp., Naples, Italy) and F. Candela. *Rass Int Clin Ter* 48(21):1351-1358, 1968.

2931 PERSONAL EXPERIENCE IN THE DIAGNOSIS AND TREATMENT OF CHRONIC GASTRITIS. *(Sp.)* Ferrando Cucarella, J. (Fac. Med., Valencia, Spain). *Rev Esp Enferm Apar Dig* 27(10):1497-1501, 1968.

2932 EVERTING PYLOROPLASTY. *(E.)* Schowengerdt C. G. (U. Cincinnati Coll. Med., Ohio). *Amer Surg* 35(4):265-266, 1969.

2933 INTRAMURAL CHEMOTHERAPY DURING GASTRIC RESECTION FOR CANCER. *(E.)* Koszarowski, T. (Inst. Oncol., Warsaw, Poland) and J. Meyza. *Acta Med Pol* 9(4):417-419, 1968.

2934 EVALUATION OF THE FACTORS OF PROGNOSIS IN STOMACH CANCER TREATMENT. *(E.)* Bajenowa, A. P. (P. A. Herzen Moscow Oncol. Res. Inst., USSR), E. V. Kozlowa and I. B. Troitskaya. *Acta Med Pol* 9(4):431-433, 1968.

2935 ON THE MORPHOLOGY OF EXOPHYTIC GASTRIC CARCINOMA. *(E.)* Smirnov, N. M. (N. N. Petrov Res. Inst. Oncol., USSR Min. Publ. Hlth., Leningrad). *Acta Med Pol* 9(4):369-371, 1968.

2936 END RESULTS IN GASTRIC CANCER. *(E.)* Oszacki, J. (Inst. Oncol., Krakow, Poland), M. Leńczyk and H. Nosek. *Acta Med Pol* 9(4):435-437, 1968.

2937 ULCER-CANCER OF THE STOMACH. *(E.)* Urban, A. (Inst. Oncol., Krakow, Poland), J. Oszacki and M. Leńczyk. *Acta Med Pol* 9(4):391-394, 1968.

2938 DIAGNOSIS AND MANAGEMENT OF CANCER STOMACH. *(E.)* Subramaniam, R. (Govt. Gen. Hosp., Madras, India). *Punjab Med J* 18(5):173-179, 1968.

2939 GASTRIC CANCER INCIDENCE IN THE CRACOW REGION. *(E.)* Kolodziejska, H. (Inst.

Oncol., Krakow, Poland) and H. Nosek. *Acta Med Pol* 9(4):65-367, 1968.

2940 MORTALITY RATE IN PATIENTS WITH GASTRIC CANCER. *(E.)* Oszacki, J. (Inst. Oncol., Krakow, Poland) and J. Kulpa. *Acta Med Pol* 9(4):443-445, 1968.

2941 REPEATED OPERATIONS FOR CANCER IN THE RESIDUAL STOMACH AFTER GASTRIC RESECTION, ACCORDING TO DATA OF THE INSTITUTE OF EXPERIMENTAL AND CLINICAL ONCOLOGY, ACADEMY OF MEDICAL SCIENCES OF USSR. *(Fr.)* Yanishevsky, V. J. (Inst. Exp. Clin. Oncol., Acad. Med. Sci. USSR, Moscow) and A. A. Klimenkov. *Acta Med Pol* 9(4):821-825, 1968.

2942 BODY COMPOSITION STUDIES IN PATIENTS WITH GASTRIC CANCER. *(E.)* Oszacki, J. (Inst. Oncol., Krakow, Poland) and A. Marczyńska. *Acta Med Pol* 9(4):395-400, 1968.

2943 BALANCE STUDIES IN PATIENTS WITH GASTRIC CANCER. *(E.)* Marczyńska, A. (Inst. Oncol., Krakow, Poland) and J. Oszacki. *Acta Med Pol* 9(4):401-405, 1968.

2944 BIOLOGICAL ASPECTS OF GASTRIC CANCER SURGERY. *(E.)* Rakov, A. I. (Res. Inst. Oncol., Min. Publ. Hlth., Leningrad, USSR). *Acta Med Pol* 9(4):355-357, 1968.

2945 CARDIAC METASTASIS OF STOMACH CANCER DIAGNOSED INTRA VITAM. A CASE REPORT AND REVIEW OF THE LITERATURE. *(It.)* Bonofiglio, A. (Pietro Cosma Munic. Hosp., Composampiero, Padua, Italy), L. Bugaro and A. Pantaleoni. *Friuli Med* 23(2):225-242, 1968.

2946 COMPARISON OF IPECAC-INDUCED EMESIS WITH GASTRIC LAVAGE IN THE TREATMENT OF ACUTE SALICYLATE INGESTION. *(E.)* Boxer, L. (Dept. Pediat., Stanford U., Calif.), F. P. Anderson and D. S. Rowe. *J Pediat* 74(5):800-803, 1969.

2947 EOSINOPHILIC GASTRIC GRANULOMA. *(It.)* Mangani, G. (Fatebenefratelli Hosp., Milan, Italy). *Policlinico [Prat]* 76(16):514-519, 1969.

2948 GEOGRAPHICAL DISTRIBUTION OF STOMACH CANCER IN CZECHOSLOVAKIA. *(E.)* Gregor, O. (1st Med. Clin., U. Hosp., Prague, Czechoslovakia), R. Toman, F. Prušová, V. Drnková and J. Pastorová. *Gut* 10(2):150-154, 1969.

2949 PRESENT POSITION OF THE ELECTRICAL STIMULATION TEST. *(E.)* Burge, H. (West London Hosp., England), T. B. L. Roberts, R. D. Stedeford and M. J. Lancaster. *Gut* 10(2):155-159, 1969.

2950 HISTOLOGIC STUDY ON THE EFFECT OF PREOPERATIVE IRRADIATION OF GASTRIC CANCER. *(E.)* Hoshi, H. (Dept. Surg., Tohoku U., Sendai, Japan). *Tohoku J Exp Med* 96(3):293-303, 1968.

2951 STUDIES ON CHRONIC GASTRITIS BY BLIND SUCTION BIOPSY. I. IDIOPATHIC CHRONIC GASTRITIS. *(Jap.)* Sugiura, Y. (Gifu U. Sch. Med., Japan). *Acta Sch Med Univ Gifu* 15(2):187-197, 1968.

2952 STUDIES ON CHRONIC GASTRITIS BY BLIND SUCTION BIOPSY. II. RELIABILITY OF GASTRIC BIOPSY. *(Jap.)* Sugiura, Y. (Gifu U. Sch. Med., Japan). *Acta Sch Med Univ Gifu* 15(2):198-207, 1968.

2953 STUDIES ON CHRONIC GASTRITIS BY BLIND SUCTION BIOPSY. III. FOLLOW-UP OBSERVATIONS ON THE SUBJECTS WITH NORMAL GASTRIC MUCOSA AND WITH SLIGHT SUPERFICIAL GASTRITIS. *(Jap.)* Sugiura, Y. (Gifu U. Sch. Med., Japan). *Acta Sch Med Univ Gifu* 15(2):208-213, 1968.

2954 CANCER PATTERNS AT KAIMOSI HOSPITAL IN WESTERN KENYA. *(E.)* Kisia, I. A. (Kaimosi Hosp., Kenya, Africa) and D. P. Burkitt. *E Afr Med J* 45(11):706-712, 1968.

2955 PATHOLOGICAL STUDY OF METASTATIC INVOLVEMENTS OF STOMACH CANCERS. *(E.)* Yamagiwa, H. (Mie Prefect. U. Sch. Med., Tsu, Japan). *Mie Med J* 17(3):255-271, 1968.

2956 GASTROILEOSTOMY. *(E.)* Bachulis, B. L. (Ohio State U. Coll. Med., Columbus) and N. R. Thomford. *Arch Surg* 98(6):786-789, 1969.

See also: 2625,2628,2643,2681,2682,2761,2762,2768,2772,2792,2794,2847,2878,2995,2999,3000,3009,3013,3134,3139, 3292,3301

2957 **TUMORS OF THE SMALL INTESTINE.** *(Dut.)* Van Rhede van der Kloot, J. F. (Diaconessen Hosp., Leiden, Netherlands) and M. Helfferich. *Nederl T Geneesk* 113(9):377-382, 1969.

Among 22 patients (6 men and 16 women, 27-76 yr old, average 54 yr) admitted for tumors of the small intestine to the Municipal Hospital at The Hague during the period 1958-68, 21 came to surgery and 1 died soon after admission due to peritonitis caused by perforation of a reticulum cell sarcoma. The other 21 cases included 6 carcinomas, 4 sarcomas, 3 carcinoid tumors, 3 myomas, 3 angiomas, 1 lipoma and 1 polyp. The jejunum was affected 11 times and the ileum 10 times, while one patient had diffuse small intestinal involvement. Although 9 patients had had chronic intermittent obstruction (sub-ileus) for 0.5-2 yr, 6 patients had had recurrent gastrointestinal bleeding for 1.5-13 yr, and 5 patients had had local peritonitis for 0.5-2 yr, most of the tumors were only diagnosed after laparotomy. Repeated X-ray examination of the small intestine is urged for all patients with similar symptoms. Curative operations were performed in 3 of 6 patients with adenocarcinoma, 4 of 5 with sarcoma and all 3 with carcinoid tumors. There was only one postoperative death (pulmonary embolism). Case reports are presented for 2 of these patients (27-yr-old woman with leiomyoma and 54-yr-old woman with leiomyosarcoma), and the literature on the subject of small bowel tumors is reviewed.

2958 **CARCINOID TUMOURS.** *(E.)* Sharpe, C. (Royal Prince Alfred Hosp., Sydney, Australia). *Med J Aust* 1(20):844-846, 1968.

During a 15-yr period in which all appendices were not examined routinely, 8 cases of appendiceal and 16 cases of extra-appendiceal carcinoids (9 cases involving ileum, 2 the duodenum, 1 each in the rectum, stomach, descending colon, jejunum and an unknown primary) were noted. In 12 of the 16 extra-appendiceal carcinoids metastases were found. The extra-appendiceal carcinoids were found predominantly in patients over 40 yr while the appendiceal neoplasms were more often found in patients below this age, and 6 occurred in males. Seven of the 16 patients with extra-appendiceal tumors died of their lesions and 6 of the total group presented themselves incidentally. Three cases presented with the carcinoid syndrome.

2959 **DIAGNOSIS AND TREATMENT OF ACUTE ABDOMINAL CONDITIONS WITH SPECIAL REFERENCE TO ROENTGENOGRAPHIC FINDINGS.** *(E.)* Matsukura, S. (Nippon Med. Sch. Tokyo, Japan) and A. Shirota *Amer J Surg* 115(6):804-811, 1968.

Of 839 patients operated on for acute mechanical obstruction over a 32-yr period, 62 had small bowel volvulus, 42 had sigmoid volvulus, and 7 volvulus of the cecum. Preoperative diagnoses were correct in only 19 of the small bowel volvulus cases which were noted to occur earlier than those of the large bowel and in a 3:1 male to female ratio. From 1935-1950 the mortality rate was 12% as compared to 5.4% from 1951 to 1966. The important roentgenographic sign in small bowel torsion was the so-called gas negative picture along with the usual obstructive findings. Improved anesthesia, antibiotics and earlier diagnoses were credited for the improvement in survival rate.

2960 **HYPERBARIC OXYGEN IN THE TREATMENT OF VOLVULUS OF THE MIDGUT: AN EXPERIMENTAL STUDY.** *(E.)* Smith, B. (Child. Hosp. Res. Found., Columbus, Ohio), E. Okamoto, E. Leal and H. W. Clatworthy Jr. *J Pediat Surg* 3(1):32-35, 1968.

In 122 Wistar rats volvulus of the midgut was produced and untwisted one to 3 hr later. Bowel wall infarction varying from moderate to very severe occurred in 88 animals, 45 of which were exposed to 100% oxygen at 3 Atmospheres for 1 hr. In the hyperbaric-oxygen-treated group 20(44%) survived. In the control group 7(16%) survived. When 75 animals with extensive infarction were considered, the survival rate for the hyperbaric-oxygen-treated animals was 35% against 2.7% for the controls. In animals that did not survive through-and-through involvement of the bowel wall with hemorrhagic necrosis and impending perforation at many sites was present at autopsy. In animals that died the average survival was less than 4 hr; this was felt to be the probable reason why no bowel perforations occurred. In most of the hyperbaric-oxygen treated animals intestinal distension was considerably less than before the hyperbaric oxygen exposure. In the hyperbaric-oxygen-treated survivors that were sacrificed, the bowel was often edematous with many areas of mucosal ulceration. The smooth muscle was generally well preserved with necrotic changes extending to the submucosa, but no further.

2961 **INTESTINAL BIOPSY IN ACUTE NUTRITION DISORDERS IN INFANTS AND SMALL CHILDREN.** *(E.)* Burdea, M. (Infantile Clin., Hosp. No. 1, Iasi, Rominia), I. Rusu, R. Mocranski, S. Jauca and D. Mirtu. *Romanian Med Rev* 12(4):30-36, 1968.

A total of 52 duodenal biopsies were obtained using an aspiration-suction biopsy catheter from 42 children who, except for 4 over 4 yr, were 1 month to 3 yr in age. The clinical diagnoses included acute dyspepsia (21), severe dyspepsia (7), toxicosis (3), and chronic relapsing dyspepsia (11) with or without ear and respiratory infections. In 16 cases the etiology was determined: *E. coli* (12 cases) and *P. vulgaris* (4). Eleven of the dyspepsia cases had normal linings to the duodenum. The lesions noted were as follows: an exudative process sometimes associated with intestinal hemorrhage that occurred durin the first 3 to 4 days in 3 cases of acute dyspepsia; a dystrophic change encountered in 2 cases of severe dyspepsia and in 1 of toxicosis; a lymphoplasmocytic infiltrate in 6 cases of relapsing chronic dyspepsia and in 4 cases of acute dyspepsia; and villous atrophy in 6 cases of relapsing chronic dyspepsia, 2 of severe dyspepsia and in 3 cases of acute dyspepsia. There were no significant complications of the procedure.

2962 **STUDIES OF INTESTINAL HEALING. IV. PREVENTION OF ADHESIONS FOLLOWING INVERTING AND EVERTING BOWEL ANASTOMOSES WIT PROMETHAZINE AND DEXAMETHASONE.** *(E.)* Kho, E.

Chicago, Ill.), R. Replogle and M. M. Ravitch. *Arch Surg*
cago) 98:764-765, 1969.

rting and inverting ileal anastomoses were each performed
8 mongrel dogs. Half of each group received promethazine
dexamethasone i.m. (1 mg/kg) 3 hr and 6 hr preoperatively,
same dose of steroids in 50 ml of saline was instilled into
peritoneal cavity at surgery and again i.m. every 4 hr 6
s, starting 2 hr after surgery. All animals were killed 7
postoperatively and evaluated for adhesions. In the con-
series 25% had slight adhesions; 75% had moderate to
re adhesions in the everting group of 24 dogs; while in the
rting group, 46% had slight and 54% moderate to severe
esions. In the steroids treated series only 33.3% of the
ted group had moderate to severe adhesions and 8.4% of
inverted group had moderate to severe adhesions.

3 CONGENITAL ATRESIA AND STENOSIS OF THE JEJUNUM AND ILEUM. *(E.)*
orimier, A. A. (U. California Med. Ctr., San Francisco),
V. Fonkalsrud and D. M. Hays. *Surgery* 65(5):819-827,
9.

otal of 619 cases of jejunal and ileal atresia and stenosis
ted at 65 institutions were analyzed. The survival rate for
nts with jejunal atresia was 58.3% and for ileal atresia 72%.
causes of death were respiratory factors, sepsis and "func-
al" obstruction at the anastomosis. Resection of the proxi-
bowel plus end-to-end anastomosis for jejunal atresia sig-
cantly improved the survival rate but proximal resection
ileal atresia did not affect the survival rate. Of 64 surgeons
ed to indicate their preferred operative technique, 44 pre-
ed end-to-end (end-to-side or end-to-oblique) anastomosis,
e indicated side-to-side anastomosis, 6 the Mikulicz enteros-
y, 5 the Bishop-Koop enterostomy, and 7 the Santulli pro-
ure.

64 CHANGES IN GASTRIC ACID SECRETION FOLLOWING RESECTION OR EXCLUSION
DIFFERENT SEGMENTS OF THE SMALL INTESTINE.
Santillana, M. (Johns Hopkins U. Sch. Med., Baltimore,
.), L. Wise, M. Schuck and W. F. Ballinger. *Surgery* 65(5):
-782, 1969.

mechanism of gastric hypersecretion following removal or
lusion of different segments of the small intestine was
died in 18 female Heidenhain pouch dogs. A striking in-
ase in gastric acid secretion followed resection of the proxi-
third of the small intestine. A variable and less significant
rease occurred after midthird resections. There was no sig-
icant change following distal third resections. Regardless of
segment removed, gastric acid secretion diminished after
otomy by an average of 47%. Lack of serotonin release
m the excluded or resected proximal intestine may be re-
nsible for the gastric hypersecretion.

5 HEMANGIOMA AS A CAUSE OF ILEUS OF THE SMALL INTESTINE. *(Pol.)* Puchalski, Z. (1st
. Surg. Acad. Med., Bialystok, Poland) and K. Turecki.
Lek 22(7):651-653, 1969.

6 EXTENSIVE TRAUMATIC NECROSIS OF THE DUODENUM IN A 4 YEAR OLD CHILD. *(Fr.)*
Caby, F. and Lascar. *Mem Acad Chir (Paris)* 95(10/11):315-316, 1969.

2967 EXTRAUTERINE PREGNANCY WITH PERFORATION INTO THE ILEUM WITH INTESTINAL OBSTRUCTION AND INTESTINAL BLEEDING. *(It.)* Tessarolo, N. (Munic. Hosp., Udine, Italy), O. Perini and E. Scanavacca. *Friuli Med* 23(3):447-457, 1968.

2968 THE CONTROL OF FLUSHING AND DIARRHOEA IN CARCINOID SYNDROME BY AN ANTI-SEROTONIN AGENT, BC105. *(E.)* Loong, S. C. (Prince Henry Hosp., Sydney, Australia), J. W. Lance and K. C. T. Rawle. *Med J Aust* 2(19):845-848, 1968.

2969 COUMADIN INDUCED SMALL BOWEL OBSTRUCTION: REPORT OF A CASE. *(E.)* Chamberlain, M. S. (Gen. Surg. Ser. Wilford Hall USAF Hosp., Lackland AFB, Texas) and W. E. Evans. *Ann Surg* 169(1): 145-148, 1969.

2970 CONSIDERATIONS IN DIVERTICULOSIS OF THE SMALL INTESTINE. *(Rum.)* Brauner, R. (Brincovenesc Hosp., Bucharest, Romania), V. Savulescu, M. Popescu, D. Olăneanu and R. Lazăr. *Med Intern (Bucur)* 21(1):3-10, 1969.

2971 ACCIDENTS DUE TO THE PRESENCE OF MECKEL'S DIVERTICULUM. *(Fr.)* Francillon, J. and J. Vignal. *J Med Lyon* 49(1155):2005-2009, 1968.

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SMALL INTESTINE

2978 **PERFORATION OF MECKEL'S DIVERTICULUM BY A FISH BONE, PRODUCING INTESTINAL OBSTRUCTION.** *(Rus.)* Nikol'skaya, O. D. (Div. Med. Hygiene, Volgograd Shipbuilding Plant, USSR). *Khirurgiia (Moskva)* 45(1):113-114, 1969.

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2987 **POLYP OF THE SECOND PORTION OF THE DUODENUM (MIXED ADENOMA: BRUNNER'S GLAND AND LIEBERKUHN GLAND).** *(It.)* Petrin, C. (Inst. Semeiotic Surg., U. Bologna, Italy), R. Galli and P. P. Pirazzoli. *Cancro* 21(2):149-164, 1968.

2988 **PERMEABILITY CHARACTERISTICS OF THE CHOLERA-INFECTED SMALL INTESTINE.** *(E.)* Love, A. H. G. (Dept. Med., The Queen's U., Belfast, England). *Gut* 10(2):105-107, 1969.

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2995 **IDIOPATHIC ADULT INTUSSUSCEPTION. CASE REPORTS.** *(E.)* Keltner, R. M. (Hancock Mich.). *Missouri Med* 65(1):43-47, 1968.

2996 **SMALL BOWEL OBSTRUCTION SECONDARY TO REPANE INGESTION. REPORT OF A CASE AND REVIEW OF THE LITERATURE.** *(E.)* Vernon, J. K. (Cambridge Hosp., Mass.). *Arch Surg* 98(6):717-719, 1969.

2997 **INTESTINAL ISCHEMIC SYNDROMES.** *(E.)* Bergan, J. J. (Northwestern U. Med. Sch., Chicago, Ill.), L. Dry, J. Conn and O. H. Trippel. *Ann Surg* 169(1):120-126, 1969.

See also: 2627,2640,2651,2680,2773,2774,2775,2789,2810,2820,2908,2914,2956,3000,3140,3145

)8 **THE EFFECTIVENESS OF XYDE (XYLAMIDE-
CR 242) IN THE TREATMENT OF GASTRO-
ODENAL ULCERS.** *(Sp.)* Giordano, G. (Inst. Spec. Med.
h., U. Naples, Italy) and L. Comi. *Medicina (Mex)* 49(1054):
3-132, 1969.

lamide (800 mg/day p.o. or i.v. for 14-30 days) was used
the treatment of 21 patients (18 men and 3 women, 24-69
old) with refractory abdominal pain and dyspepsia, includ-
15 with radiologically diagnosed gastroduodenal ulcers (2
whom had blood in the feces), 4 with previous gastric sur-
y, and 4 with definite gastroduodenitis. Marked improve-
nt was obtained in 18 cases, starting during the first few
/s of treatment. Bleeding stopped in the 2 cases with fecal
od, and the secretion of free and total acid decreased sharply
the 11 cases studied. In most cases followed, the improve-
nt persisted several months after discontinuation of treat-
nt. The 3 cases with a poor response included one patient
h chronic liver disease and cirrhosis, one with gastric symp-
ns resulting from the prolonged use of corticosteroids for
onic lymphatic leukemia, and one with a gastrectomy-in-
ced recurrent ulcer and no free HCl.

)9 **CLINICAL TRIAL OF A NEW NON-ANTI-
CHOLINERGIC COMPOUND WITH PROTECTIVE
D ANTISECRETORY ACTIVITY IN THE TREATMENT
GASTRITIS AND GASTRODUODENAL ULCERS.** *(Sp.)*
ntino, M. (Gen. Surg. Clin., U. Turin, Italy) and L. Roccia.
dicina (Mex) 49(1054):114-123, 1969.

e therapeutic effectiveness of xylamide (10 cc/day i.v. for
-34 days, 5 cc/day i.m. for 20-30 days, or 4 tablets/day
. for 20-30 days) was tested in a clinical trial on 70 patients
l men and 19 women, 19-64 yr old) with gastroduodenal
ions of 1-14 yr duration. The group included 27 patients
th duodenal ulcers, 15 with gastric ulcers, 4 with peptic
cers of other localizations, and 24 with gastroduodenitis.
ile 42 patients were given the drug i.v., 16 received it i.m.
d 12 were treated by the oral route. Gastralgia, pyrosis,
ychic tension and vomiting disappeared by the end of treat-
ent in all cases, and within the first 7 days in most. There
ere no side effects. Based on pre- and post-treatment X-ray
aluation, 27 patients were cured, 34 showed improvement,
d 9 were unchanged. Gastric secretion studies showed that
th spontaneous and histamine-stimulated acid secretion were
arkedly decreased by xylamide.

)00 **TREATMENT OF SOME TYPES OF CHRONIC
GASTRODUODENITIS AND PEPTIC ULCERS
ITH A DERIVATIVE OF AN ALICYCLIC CARBOXYLIC
CID (XYLAMIDE) WHICH CAN EITHER BY INJECTED
TRAVENOUSLY OR INTRAMUSCULARLY OR BE GIVEN
Y MOUTH.** *(Sp.)* Abbona, C. (Gen. Med. Clin., U. Genoa,
aly), P. L. Gatto and G. C. Bezante. *Medicina (Mex)*
)(1054):132-141, 1969.

he nonanticholinergic antisecretory agent xylamide (N-benzoyl-
',N'-di-n.-propylisoglutamine) was administered to 3 normal
ale controls, 11 patients (8 males and 3 females), 12-65 yr-
d) with dyspepsia due to nonspecific, chronic gastroduodeni-
s (including 5 with chronic superficial and 4 with chronic
atrophic or preatrophic gastritis as shown by gastric biopsy), and 12 patients (7 men and 5 women, 25-81 yr old) with confirmed peptic ulcers as well as gastritis. The drug was given at a dosage of 800-1600 mg/day i.v. plus 400-800 mg/day p.o. for 12-40 days. There was no effect on gastric secretion or histology in the 3 normal controls. Studies of spontaneous and histamine-stimulated gastric acid and pepsin secretion before and after treatment revealed only slight and generally insignificant decreases in the 11 patients with nonspecific gastroduodenitis; in the patients with peptic ulcers, however, there were marked decreases in both parameters, accompanied in most cases by an improvement in the histological appearance of the mucosa and by alleviation of symptoms such as dyspepsia, abdominal pain, nausea, pyrosis, sialorrhea, meteorism and esophageal reflux, usually within 5-7 days. There were no side effects. Radiological studies showed that the i.v. injection of 1200 mg of xylamide produced parietal hypotonia equal to that produced by anticholinergic agents. However, the mechanism of action of this effective antisecretory agent remains unclear.

3001 **EXPERIMENTAL TOXICOLOGY AND PHARMACOLOGY OF A NEW, NON-ANTI-CHOLINERGIC, ANTISECRETORY PREPARATION (CR-242, XYLAMIDE, XYDE) HAVING A PROTECTIVE EFFECT ON THE GASTRIC MUCOSA.** *(Sp.)* Rovati, A. L. (Rotta Res. Lab., Milan, Italy), P. L. Casula and G. da Re. *Medicina (Mex)* 49(1054):88-106, 1969.

Detailed data are presented on the antisecretory activity of xylamide in pylorus-ligated (Shay), gastric-fistula, and duodenum-clamped rats, guinea pigs and dogs (all gastric secretion), mice (lacrimal secretion), rabbits (parotid gland secretion), and intact rats (biliary secretion), the comparative antisecretory activity of xylamide, atropine and serotonin, the protective effect of xylamide against glucose-, ligation- and restraint-induced ulcers, the effects of xylamide on the cardiovascular and respiratory systems (cats, rats and rabbits), the effect of xylamide on intestinal motility in the guinea pig (isolated ileum), rat (intestinal transit) and cat (duodenum), the effect of xylamide on the central nervous system (rats and mice), the antihistaminic, analgesic, mydriatic and antiinflammatory activities of xylamide (guinea pigs, mice and rats), the acute and chronic general toxicity of xylamide (mice and dogs), and the possible effects of xylamide on reproduction (rats, mice, rabbits and chick embryos). It is concluded that xylamide is a specific inhibitor of gastric secretion lacking all atropinic activity, which has both a direct protective effect on the gastric mucosa and a musculotropic antispasmodic action. Its mechanism of action is different from that of either atropine or serotonin, and its toxicity is extremely low. No evidence of teratogenicity could be demonstrated.

3002 **PEPTIC ULCERS AND ADRENOCORTICAL FUNCTION: NEW ASPECTS OF AN OLD PROBLEM.** *(It.)* Cagnoni, M. (Inst. Gen. Med. Clin., U. Florence, Italy), B. Tarquini, F. Fantini and R. Orzalesi. *Arch Ital Mal Appar Dig* 35(3):232-246, 1968.

In 16 patients with peptic ulcers, temporal studies of adrenocortical function in relation to the time of day revealed a circadian rhythm with a 3-hr lag compared to the rhythm observed in 33 healthy controls. Studies in 7 peptic ulcer patients after surgical treatment (gastrectomy in 3 and bilateral vagotomy in 4) demonstrated that this desynchronization of the adrenocortical activity persists after peptic ulcer surgery. In 6 additional peptic ulcer patients, the adrenocortical response to hypoglycemic stress (0.1 U/kg of insulin i.v. while fasting) was found to be sharply increased compared to that in 7 controls. The results suggest an exaggerated adrenocortical response to hypoglycemia in patients with peptic ulcers, and indicate that desynchronization of adrenocortical activity may play a role in the pathogenesis of this disease.

3003 THE USE OF SULPIRIDE IN THE TREATMENT OF PEPTIC ULCERS. *(Fr.)* Cornet, A. (Laennec Hosp., Paris, France) and M. Grivaux. *Sem Hop Paris* 45(13):840-861, 1969.

In view of the proposed role of the hypothalamus in regulating the motor and secretory activity of the stomach and hence in the pathogenesis of peptic ulcers, sulpiride [N-(1-ethyl-2-pyrrolidylmethyl)-2-methoxy-5-sulfamoylbenzamide; 150 mg/day initially, decreased to 100 mg/day for 15-20 days], which is a centrally acting antiemetic and analgesic, was used in the treatment of 60 patients (51 men and 9 women) with a long-term history of refractory peptic ulcer disease (46 ulcers of the duodenal bulb, 11 stomach ulcers, and 3 patients with prior peptic ulcer surgery, one of whom had a double ulcer). As a result of sulpiride therapy, pain decreased in 54 cases and there was radiological improvement in 39. Postoperative histopathological studies confirmed the curative effect of this new agent in a large number of intractable cases, and acute attacks went into rapid remission. The pharmacological activity of the drug in experimental animals is reviewed at length, and preliminary studies are reported which confirm the activity of sulpiride on gastric secretion and motility in man, presumably via an indirect mechanism involving the central nervous system. Thus, among 40 subjects in whom the gastrointestinal motility was recorded before and after 100 mg of sulpiride i.v., 27 showed strong active contractions involving the stomach, duodenum and jejunum, 10 showed only moderate activity, and 3 showed no response. Among 27 patients with ulcers of the duodenal bulb, 19 showed a decrease in gastric acidity after sulpiride, although in many cases hyperchlorhydria returned despite continuation of treatment.

3004 A STUDY OF THE SERUM PROTEIN FRACTIONS IN PATIENTS WITH GASTRIC ULCERS. *(Pol.)* Adamczyk, B. (2nd Surg. Clin., Acad. Med. Krakow, Poland) and K. Durek. *Pol Przegl Chir* 48(5):553-558, 1968.

An immunoelectrophoretic study of the serum proteins in 15 patients with gastric ulcers and 14 healthy controls revealed no significant differences between the two groups. The total protein was 6.7 and 7.42 g%, resp., the albumin was 3.35 and 3.88 g%, the globulin distribution was similar, and both groups showed 10-15 precipitation lines (average 12.87 and 12.16, resp.), including 1 each for albumin and α-globulin, 0-2 for the β_2 globulins, 1-3 for the β_1 globulins, and 2-7 for the α-globulins. Precipitation tests by the method of Hitzig, using specific antisera, revealed somewhat higher concentrations of α-2M-globulin, α-2-lipoprotein, β-2M-globulin and β-lipoprotein in patients with gastric ulcers.

3005 FUNCTIONAL STUDY OF THE PARATHYROID GLANDS IN CASES OF GASTRODUODENAL ULCER IN THE CYCLE OF CLINICAL ACTIVITY. *(It.)* Mirabile, E. (Inst. Gen. Clin. Surg., U. Catania, Italy), M. Zanghi and N. Alberti. *Chir Ital* 20(1):75-86, 1968.

Parathyroid gland function was studied in 100 men (between the ages of 19-62 yr) with clinically active gastroduodenal ulcers. Studies included serum calcium, inorganic phosphorus levels, and the Howard, Hopkins and Connor tests. Results showed 22% of patients had signs of hypoparathyroidism (as evidenced by a consistent reduction in plasma calcium, a consistently high serum phosphorus, normal or reduced alkaline phosphatase activity, and positive reactions to the histamine test) and 3% signs of hyperparathyroidism.

3006 REAPPRAISAL OF THE LONG-TERM EFFECTS OF SELECTIVE VAGOTOMY. *(E.)* Smith, G. K. (Good Samaritan Hosp. Med. Ctr., Los Angeles, Calif.) and J. M. Farris. *Amer J Surg* 117(2);222-227, 1969.

Seventy patients who had selective (bilateral, anterior or posterior) vagotomies and pyloroplasty for gastric and/or duodenal ulcers, esophageal hiatal hernias or peptic esophagitis were evaluated an average of 5.2 yr postoperatively. Ten patients presented evidence of the jejunal hyperosmotic syndrome. Nine others experienced significant alterations in bowel habits and one complained of intermittent diarrhea. There was no correlation between symptoms and the type of selective procedure. Three patients had postoperative bleeding and 6 underwent reoperation for malfunctioning pyloroplasties. Compared to a group of similar patients with truncal vagotomies there was no difference in the incidence of extragastric side-effects. Since selective vagotomy is considerably more difficult to perform, the indications for this procedure should be carefully reviewed.

3007 SURGICAL MANAGEMENT OF RECURRENT PEPTIC ULCERS. *(E.)* Jaffe, B. M. (Dept. Surg., Washington U., St. Louis, Mo.), W. T. Newton, D. R. Judd and W. F. Ballinger II. *Amer J Surg* 117(2):214-221, 1969.

A retrospective study of 107 patients (92 men and 15 women, mean age 49 yr) with recurrent peptic ulcers revealed that 56 had initially been treated by partial gastrectomy, 29 by gastrojejunostomy, and 22 by vagotomy and either antrectomy, pylor plasty, or gastrojejunostomy. Eighty-nine had originally present with duodenal ulcers, 9 with gastric ulcers and 4 with both. At the time of the secondary procedures, 31% had serious medical illnesses, 6 had undergone prior operations for marginal ulcers, and 8 others had dumping symptoms. After one procedure for recurrence 57% had good results and after two procedures 65% improved. Vagotomy was most successful after partial gastrectomy and the latter achieved occasional success when the initial treatment had been limited to vagotom There were 6 postoperative deaths, not including any treated by vagotomy alone.

3008 GASTRIC ULCER AND ALKALINE REGURGITATION. *(E.)* Nelson, P. G. (Royal Melbourne Hosp., Australia). *Med J Aust* 1(5):216-218, 1969.

Six control patients without evidence of duodenal ulcer failed to demonstrate pyloric regurgitation of radioopaque material. Two patients with duodenal scarring, however, showed vigorou

eflux of the same material due to pyloric incompetence. De-
iled case reports are presented for 2 patients with duodenal
lcer associated with and preceding gastric ulcers, as well as
patients with gastric ulcers developing in stomach remnants
fter gastrectomy for duodenal ulcer. In the first 2 cases, re-
ux due to duodenal scarring is postulated as playing a role
the etiology of the gastric ulcers, while in the latter cases
ile or alkaline jejunal reflux is incriminated.

009 GASTRIC BIOPSY AND GASTRIC JUICE AFTER HISTAMINE STIMULATION IN ATIENTS GASTRECTOMIZED FOR DUODENAL ULCERS.

t.) Colavolpe, V. (S. Camillo Hosp., Rome, Italy) and R. C.
asile. *Arch Ital Mal Appar Dig* 34(2):193-205, 1967.

eroral gastric biopsy was performed on 41 patients (males
nly, aged 30-67 yr) 4 months to 37 yr after gastrectomy
Billroth II) for duodenal ulcers. Histological examination was
ormal in 25 and showed gastritis in 16 patients (39%): super-
cial in 1, interstitial in 9, preatrophic in 1, and atrophic in
. Achylia was found in 29 (1 with superficial gastritis, 7 with
iterstitial, 1 with preatrophic, 5 with atrophic); hypoachylia
6 (2 with interstitial gastritis); normoachylia in 2 and hyper-
chylia in 4 (with normal mucosa). No hyperachylia was found
patients over 60 yr. It was impossible to establish a corre-
tion between the presence of gastric lesions, gastric juice
udy, the patient's age and the time elapsed after operation.

010 STUDIES ON GOLD THIOGLUCOSE ULCEROGENESIS.

(E.) Luparello, T. J. (State U. New
ork, Downstate Med. Ctr., Brooklyn). *J Psychosom Res*
3(1):113-118, 1969.

old thioglucose (0.5 and 0.25 mg/g i.p.) was given to several
roups of 50 Harley-strain male guinea pigs weighing 350-450
. Each group revealed peak gastric ulceration in 2 days which
leared at the lower dose level in 5 days. When varying doses
).0015-0.1 mg/g) were administered to groups of 10 animals
ia either the internal carotid artery or the jugular vein, the
ntracarotid route proved 5.5 times as ulcerogenic. Pretreat-
ient of guinea pigs with 0.3 mg/g of gold thioglucose failed
cause a significant difference in gastric ulcerogenesis when
he animals challenged 50 days later with the same dose along
ith controls. When the animals challenged 50 days later with
he same dose along with controls. Pretreatment with this
ose also did not affect restraint ulcer formation. No destruc-
ve changes were noted in the hypothalamus in any of the
xperiments.

011 INFLUENCE OF AGE, SEX, SEASONS AND CERTAIN METEOROLOGICAL FACTORS ON EMORRHAGES OF GASTRO-DUODENAL ULCERS. BASED N 2108 CASES OBSERVED IN ATHENS OVER A TEN EAR PERIOD.

(Fr.) Maschas, H. (Athens, Greece), G.
hilaïditis, L. Sparros and A. Floras. *Arch Franc Mal Appar*
ig 58(3):129-138, 1969.

ased on 2108 cases (1408 males and 680 females) of gastric
emorrhage resulting from ulcers, the incidence of hemorrhage
ccurred more frequently in males, and between the ages of
)-69 yr. Daily recordings of the influence of and variations
, atmospheric temperature and pressure were maintained for
585 of these cases over a 8 yr period. Although hemorrhages
ccurred more frequently during cold periods, they appear to
be influenced by sudden significant variations in temperature (decrease) and pressure, than by the cold.

3012 A CO-OPERATIVE DOUBLE-BLIND EVALUATION OF GASTRIC FREEZING IN THE TREATMENT OF DUODENAL ULCER.

(E.) Ruffin, J. M. (Duke U. Med. Ctr., Durham, N. C.), J. E. Grizzle, N. C. Hightower, G. McHardy, H. Shull and J. B. Kirsner. *New Eng J Med* 281(1):16-19, 1969.

A double-blind evaluation of gastric freezing in the treatment of duodenal ulcer was initiated in 1963 and conducted simultaneously in 5 institutions on a total of 160 patients; 82 of these had the true freeze with the temperature of the coolant at -10C while 78 had a sham procedure with the temperature of the coolant at 37C. The average duration of peptic ulcer disease in both groups was 9.3 yr, and 29 and 26 patients, resp., had a history of bleeding. Follow-up extending as long as 2 yr showed conclusively that the freezing procedure is no better than sham freezing in the treatment of duodenal ulcers. There was no significant difference in relief of pain, secretory suppression, the number and severity of recurrences, or the development of "end points" (perforation, hemorrhage, obstruction, emergency surgery) in the two groups. It is reasonable to assume that the relief of pain and subjective improvement reported by earlier investigators were probably due to the psychologic effect of the procedure.

3013 BIOPSY EXAMINATIONS OF THE STOMACH IN CASES OF ULCER.

(Ger.) Seifert, E. (First Med. Div., Hanuse Hosp., Vienna). *Med Welt* 19(1):67-71, 1968.

Biopsies of the gastric mucosa were obtained by a suction probe-excision device (Henning and Heinkel) in 1000 non-selected cases of abdominal disorders (including 672 without ulcers or gastric resection, 83 with gastric ulcers and 143 with duodenal ulcers). Statistically significant differences in alteration of the gastric mucosa were found only in the group of patients with duodenal ulcers. Biopsies from the fundus ventriculi of duodenal ulcer patients showed the mucosa to be frequently lighter and rarely more markedly altered than those of the comparison group consisting of the 672 patients without ulcer or gastric resection. The differences are age dependent, and patients in the duodenal ulcer group were younger than those in the comparison group. The mucosa of ventricular ulcer patients showed marked damage more frequently than that of duodenal ulcer patients. These findings suggest that description of ulcers with "accompanying gastritis" is not justified because gastritis in the corpus is an entity separate from the ulcer.

3014 GASTRIC EMPTYING RATE IN GASTRIC AND DUODENAL ULCERATION. A CLINICAL STUDY INCLUDING THE CHANGES OF THE GASTRIC CONTENTS AFTER A LIQUID TEST MEAL.

(E.) Brömster, D. (Dept. Surg., Serafimlasarettet, Stockholm, Sweden). *Scand J Gastroent* 4(2):193-201, 1969.

The gastric emptying rate and the changes of the gastric contents 2 hr after intake of a liquid meal were investigated in 13 healthy volunteers, 7 patients with gastric ulcer, 15 patients with duodenal ulcer, 8 patients operated on for duodenal ulcer and 3 patients with pernicious anemia. In controls the mean half-life of the test meal was 37 min; in patients with gastric ulcer, 62 min; and in patients with duodenal ulcer 31 min. The 3 patients with pernicious anemia had mean values of 79 min and each showed values which exceeded the highest values of the controls. The changes of the gastric contents (pH, osmolarity and hydrochloric acid secretion) indicated that the quantities of gastric juice secreted were small in gastric ulceration.

3015 REDUCTION OF GASTRIC ACID SECRETION ON A LOW-SALT DIET AND FUROSEMIDE. *(E.)* Kothari, M. L. (Charitable Hosp., Bombay, India), J. C. Doshi, H. G. Desai, A. B. Vaidya, U. K. Sheth and J. M. Mehta. *Gut* 10(1):71-73, 1969.

Gastric acid secretion was studied in 18 subjects (17 males and 1 female) either by the augmented histamine test in 7 of the subjects (1 healthy control and 6 duodenal ulcer patients) who were placed on a low-salt diet or by the histamine infusion test in the remaining 11 subjects (5 healthy controls and 6 duodenal ulcer patients) who were given furosemide (40 mg twice daily for 10 days, p.o.). All 7 subjects in the first group showed a significant decrease in acid output, which also occurred in 9 of the 11 furosemide subjects. These results may indicate a new approach to the management of peptic ulcer.

3016 MORTALITY IN PERFORATED PEPTIC ULCERS. ANALYTICAL STUDY OF 81 CASES. *(Sp.)* Manrique, J. (San Martin Polyclin., Argentina), O. J. Ferrari, A. Imposti and A. S. Introzzi. *Rev Argent Cir* 13(1-2-3):43-45, 1967.

The mortality rate in a series of 81 patients with gastroduodenal ulcers (46 with stomach ulcers and 35 with duodenal ulcers) was studied. Mortality in perforated ulcer cases was found to be related to the following factors: age (0 mortality under 40 yr, 23.5% between 40-59 yr, and 33.0% over 59 yr); sex (17.3% mortality in males, 33.3% in females); acute irritation with collapse; abdominal distention (a sign of diffuse peritonitis); abdominal drainage; shock, fibrosis; and lesion size (100% mortality when lesion was greater than 10 mm in diameter). More health and medical education is recommended to shorten the period between inception of the complication and initiation of treatment—an important consideration for survival. Gastrectomy is preferred over a simple closure procedure in cases where the sclerotic ulcer is larger than 10 mm in diameter.

3017 ANTRECTOMY AND VAGOTOMY IN TREATING PEPTIC ULCER. *(Por.)* De Siqueira, J. T. and D. S. J. Bichara. *Hospital (Rio)* 74(5):1649-1669, 1968.

3018 WHICH OPERATION IN ELECTIVE TREATMENT FOR BENIGN GASTRIC ULCER? *(E.)* Strode, J. E. (Straub Clin., Honolulu, Hawaii). *Postgrad Med* 45(5):94-98, 1969.

3019 PEPTIC ULCER. AN ABNORMALITY IN GASTRIC SECRETION. *(E.)* Dragstedt, L. R. (Dept. Surg., U. Florida, Gainesville). *Amer J Surg* 117(2):143-156, 1969.

3020 THE IMMEDIATE EFFECTS OF TRUNCAL AND SELECTIVE VAGOTOMY. *(Fr.)* Alexiu, O. (Babes Hosp., Bucharest, Romania) and E. Pacescu. *Acta Gastroent Belg* 31(12):843-844, 1968.

3021 COMPLICATIONS AND MORTALITY AFTER VAGOTOMY FOR DUODENAL ULCERS. *(Fr.)* Pietri, P. (Dept. Clin. Surg., Fac. Med., U. Modena, Italy), P. A. Fantoni and R. Domeniconi. *Acta Gastroent Belg* 31(12): 858-860, 1968.

3022 THE FUNCTIONAL RESULTS OF VAGOTOMY: EARLY CHANGES IN PROTEIN AND LIPID REABSORPTION. *(Fr.)* Pietri, P. (Inst. Clin. Surg., U. Modena, Italy), V. Piaggi and P. A. Fantoni. *Acta Gastroent Belg* 31(12):911-914, 1968.

3023 GASTRIC SECRETION IN RELATION TO THE EVOLUTION OF ULCERS. *(It.)* Rocchi, V. (Inst. Gen. Surg. Clin., U. Rome, Italy), V. Ziparo and M. Borghese. *Fegato* 14(4):515-523, 1968.

3024 RESULTS OF THE SURGICAL TREATMENT OF GASTRODUODENAL ULCERS. *(Sp.)* Martinez-Pineiro Carames, M. (Gran Beneficencia Hosp., Lozano, Spain), P. A. Serrano Sanchez and A. Clerigue. *Cir Ginec Urol* 22(5):503-509, 1968.

3025 THE EFFECTIVENESS OF TREATING PATIENTS WITH PEPTIC ULCERS UNDER THE CONDITIONS OF A DISTRICT HOSPITAL. *(Rus.)* Ostashevskaia, Ie. D. (Lenin Distr. Hosp., Odessa, USSR). *Sovet Med* 31(11): 110-114, 1968.

3026 VAGOTOMY IN CASES OF PEPTIC ULCERS. *(Rev.)(Rus.)* Bershadenko, D. D. (P. Lumumba U. Friendship Nations, Moscow, USSR). *Khirurgiia (Moskva)* 45(2):118-123, 1969.

3027 PERFORATED PEPTIC ULCER: A REVIEW OF 29 CASES. *(E.)* Nagar, R. K. (M. L. N. Med. Coll., Allahabad, India). *Punjab Med J* 18(5):196-200, 1968.

3028 CHOLEDOCHODUODENAL FISTULA COMPLICATING CHRONIC DUODENAL ULCER IN NIGERIANS. *(E.)* Lewis, E. A. (Dept. Med. Radiol., U. Ibadan, Nigeria) and S. P. Bohrer. *Gut* 10(2):146-149, 1969.

3029 STUDIES ON THE COURSE OF GASTRIC ULCER. *(Jap.)* Ikehata, A. *Nichidai I Z* 28(3): 281-300, 1969.

3030 THE CYBERNETICS OF PEPTIC ULCER. *(E.)* Harvey, N. A. (Glens Falls Hosp., N. Y.). *New York J Med* 69(3):430-435, 1969.

3031 POSTERIOR PERFORATED ULCER. *(E.)* Alvarez, W. C. *Mod Med* 37(9):99-100, 1969.

3032 PEPTIC ULCER PERFORATION OF THE GASTRODUODENAL ARTERY COMPLEX: CLINICAL FEATURES AND OPERATIVE CONTROL. *(E.)* Berne,

. J. (U. Southern California Sch. Med., Los Angeles) and L. osoff. *Ann Surg* 169(1):141-144, 1969.

3033 **PEPTIC ULCER IN MASSACHESETTS PHYSICIANS.** *(E.)* Monson, R. R. (Harvard Sch. Publ. Hlth., Boston, Mass.) and B. Mac Mahon. *New Eng J Med* 281(1):11-15, 1969.

3034 **ACTIVATION LEVEL AND THE PRODUCTION OF GASTRIC ULCERATION IN THE RAT.** *(E.)* Hornbuckle, P. A. (Virginia Commonwealth U., Richmond, Va.) and W. Isaac. *Psychosom Med* 31(3):247-250, 1969.

See also: 2673,2678,2780,2815,2879,2880,2905,2924,2925,2937,3284

3035 **EMERGENCY SURGERY IN REGIONAL ENTERITIS (CROHN).** *(Fr.)* Turai, I. (Emergency Hosp., U. Bucharest, Romania), E. Lupu, P. Blidaru, E. Roşeala, M. Dimitriu and S. Stan. *Rev Med Moyen Orient* 24(4):299-309, 1967.

Among 21,793 hospitalized patients in 4 yr, 7586 were admitted because of acute abdominal conditions, and 25 (0.33%) of these were for regional enteritis. Fourteen patients were below 45 yr and 11 above 45 (17 were male and 8 female). Nineteen were in stage I and 10 of the 19 were complicated; 6 were in stage II and 5 of the 6 were complicated. The most frequent localization was the ileum (10), the ileum with other sites (9), the jejunum (4), and the duodeno-jejunum (1). Radiological studies were made in only 3 preoperatively. Twenty-three were treated surgically. There have been 8 recurrences during a 4 yr followup. Radiotherapy was useful in the acute phase. Prognosis is reserved and work capacity limited.

3036 **THE OPERATIVE TREATMENT OF CROHN'S DISEASE COMPLICATED BY FISTULAE. A PERSONAL CONSECUTIVE SERIES.** *(E.)* Enker, W. E. (U. Chicago Hosp., Ill.) and G. E. Block. *Arch Surg* 98(4): 493-499, 1969.

The preoperative management and surgical treatment of 19 patients (10 men and 9 women, 17-59 yr old) having regional enteritis with fistulae are presented. Ten of the 19 patients had had a total of 20 operations for regional enteritis. Enterocutaneous (10), enteroenteric (4), enterocavitary (5), ileocolic (3) and enterovesicocutaneous (1) fistulae were encountered. Corticosteroid therapy had been given to 68% of the patients for 2 weeks to 3 yr. Operative procedure consisted of the transverse abdominal incision and en bloc resection of the diseased bowel in continuity with the contaminated fistula tract, anastomosis of the end of the small bowel to the side of the colon, and drainage of abdominal abscesses and fistulae tracts. Copious irrigation of the abdomen with normal saline was used in all patients without intra-abdominal antibiotics. There were no operative deaths; two late deaths (one from nutritional cirrhosis and the other from metastatic adenocarcinoma of the small bowel) were unrelated to surgery.

3037 **REGIONAL ENTERITIS.** *(Sp.)* Pera Jimenez, C. *Rev Esp Enferm Apar Dig* 27(10):1483-1496, 1968.

3038 **ADENOCARCINOMA OF THE SMALL INTESTINE AND OTHER MALIGNANT TUMORS COMPLICATING REGIONAL ENTERITIS. CASE REPORT AND REVIEW OF THE LITERATURE.** *(E.)* Tyers, G. F. O. (Philadelphia VA Hosp., Pa.), E. Steiger and S. J. Dudrick. *Ann Surg* 169(4):510-518, 1969.

See also: 3042,3103,3115,3120

)39 INCREASED RATIO OF GLYCINE- TO TAURINE-CONJUGATED BILE SALTS IN PATIENTS ITH ILEAL DISORDERS.

(E.) Garbutt, J. T. (Duke U. ed. Ctr., Durham, N. C.), K. W. Heaton, L. Lack and M. P. vor. *Gastroenterology* 56(4):711-720, 1969.

ie relative conjugation of cholic acid with glycine and taurine :T ratio) was studied in duodenal fluid obtained from 13 tients with ileal disorders, 4 patients with disorders which volved the duodenojejunum primarily (2 with nontropical rue and 2 with Whipple's disease), and 5 student volunteers. ie enterohepatic recirculation of sodium taurocholate-24-^{14}C is studied in all subjects, and the relative conjugation (G:T tio) of deoxycholate-^{14}C, derived from bacterial metabolism the injected taurocholate-^{14}C, was measured in appropriate iodenal samples. In selected experiments, unconjugated bile lts, cholic acid-^{14}C and deoxycholic acid-^{14}C, were each adinistered i.v., and their relative conjugation (G:T ratio) was easured in duodenal samples obtained throughout an initial hr period and serially thereafter. For both bile salts, the west G:T ratio exhibited by patients with a disorder of the um was higher than the highest G:T ratio observed in either ident volunteers or patients with duodenojejunal disorders. iese changes were related to the markedly decreased enteropatic recirculation of injected taurocholate-^{14}C and injected oxycholate-^{14}C in patients with ileal disorders. The G:T tio of cholic acid-^{14}C and deoxycholic acid-^{14}C was elevated comparable levels in duodenal fluid sampled throughout the hr period following intravenous injection of these bile salts to patients with ileal disorders. Serial determinations of :T ratio for deoxycholate-^{14}C were similar to initial values ter injection of either deoxycholate-^{14}C or taurocholate-^{14}C. ius, the hepatic origin of these altered G:T ratios has been monstrated. Although the precise mechanism involved in e production of these changes was not determined, oral adinistration of taurine to patients with ileal disorders resulted a marked decrease in G:T ratio, demonstrating a maintained pacity for conjugation with taurine. Patients with Whipple's sease exhibited G:T ratios for both bile salts which were inrmediate between those of student volunteers and patients ith nontropical sprue, on the one hand, and patients with al disorders on the other, decreasing to a normal range after eatment.

3040 CALCIUM KINETIC STUDIES IN PATIENTS WITH MALABSORPTION SYNDROME.

(E.) arrison, J. E. (Toronto Gen. Hosp., Ontario, Canada), A. J. W. itchman, J. M. Finlay and K. G. McNeill. *Gastroenterology* 5(4):751-757, 1969.

a group of 12 patients with steatorrhea secondary to various iologies, defective calcium absorption and negative calcium alance occurred in all patients with biochemical osteomalacia. osses of body calcium resulted from obligatory endogenous cal losses. High endogenous fecal calcium values appeared be due to increased digestive juice secretions as well as dective reabsorption. Bone calcium turnover in osteomalacia aried from below to well above the normal range in agreement ith reported data on bone biopsy studies. Markedly elevated one calcium accretion rates were found in idiopathic steatoriea alone and were associated with advanced bone disease.

3041 STUDIES OF MALABSORPTION OCCURRING IN PATIENTS WITH LAENNEC'S CIRRHOSIS.

(E.) Marin, G. A. (Philadelphia Gen. Hosp., Pa.), M. L. Clark and J. R. Senior. *Gastroenterology* 56(4):727-736, 1969.

The review of autopsy protocols and histological sections of 154 patients with Laennec's cirrhosis revealed an incidence of pancreatic lesions of 28%. A prospective study of the small bowel absorptive function of 20 alcoholic cirrhotics revealed steatorrhea in 10 of them. No other parameter of small bowel absorption showed significant abnormality. Radiological studies of the intestine, Schilling tests, and small bowel biopsies were within normal limits. The D-xylose test was normal in the 20 patients as judged by normal blood levels; decreased 5-hr urinary excretion was only found in those patients with ascites or decreased renal function. Normal bacterial population was found in the duodenum of 19 of these patients. The steatorrhea found in the 10 patients could be ascribed to neomycin administration in 3 of them and to severe pancreatic insufficiency in another 4. The remaining 3 patients had maximal bicarbonate concentrations below normal levels and, therefore, probable pancreatic insufficiency. The results reveal that the steatorrhea found in these patients with Laennec's cirrhosis was secondary to either neomycin administration or pancreatic insufficiency, rather than to the cirrhotic process per se. These results indicate that small bowel absorptive function is normal in cirrhosis and that the steatorrhea commonly found in association with this disease is secondary to a variety of other disorders.

3042 IMMUNOGLOBULIN G (IgG) METABOLISM IN GASTROINTESTINAL PROTEIN LOSS.

(Dan.) Soltoft, J. (State Hosp., Copenhagen, Denmark), H. Westergaard, G. Bendixen, K. Bro-Jorgensen, M. Yssing and S. Jarnum. *Ugeskr Laeger* 130(21):892-897, 1968.

Immunoglobulin G (IgG) and albumin metabolism was investigated by the use of radioiodine-labeled substrates in 18 patients (1-59 yr old) with gastrointestinal protein loss (due to lymphangiectasis, Crohn's disease, ulcerative jejunitis, Menetrier's disease, the Cronkhite-Canada syndrome, or unknown factors) and in 11 healthy controls (29-91 yr old) in order to determine whether protein-losing enteropathy affects albumin and immunoglobulins to the same extent. For the 18 patients as a group and for the 7 patients with lymphagiectasis in particular, albumin loss (as a percentage of the intravscular pool per day) was greater than IgG loss (17-60%/day and 16-47%/day, resp. for lymphangiectasis), probably because plasma proteins with lower molecular weights tend to be lost more rapidly than those with higher molecular weights. The normal average IgG loss in the 11 controls was 6.6%/day. In 5 patients with Crohn's disease, however, IgG loss was greater than albumin loss (12-29%/day and 11-20%/day, resp.), and in 3 of these IgG synthesis was up to 10 times as high as the normal average (155-318 mg/kg/day compared to 16-57 mg/kg/day in controls). Similar stimulation of immunoglobulin metabolism is seen in other types of intestinal inflammation.

3043 BLIND LOOP SYNDROME IN CHILDREN: MALABSORPTION SECONDARY TO INTESTINAL STASIS.

(E.) Bayes, B. J. (Res. Inst., Hosp. Sick Children,

Toronto, Canada) and J. R. Hamilton. *Arch Dis Childh* 44(233): 76-81, 1969.

Case reports are presented for 4 patients (1 male and 2 female infants, 2 wk to 2 yr of age, plus a 10-yr-old boy) with malabsorption secondary to intestinal stasis. Stunting of growth and increased fecal fat excretion were noted in each case, but the latter decreased in 3 cases after tetracycline therapy. Three of the cases followed intestinal surgery and 1 was due to a congenital mid-jejunal diaphragm. In 3 children, trypsin and chymotrypsin studies were normal and in the other the pancreas was normal at post mortem. A megaloblastic bone marrow and abnormal Schilling test with a normal FIGLU test were found in one of two patients subjected to hematologic studies. Successful surgery was performed on two of the patients and in each the duodenal mucosa was normal.

3044 ACTIVE ABSORPTION OF D-XYLOSE IN CHILDREN. *(E.)* Beyreiss, K. (Child. Hosp., Karl-Marx U. Leipzig, Germany), H. Theile and H. Willgerodt. *German Med Monthly* 13(11):544-548, 1968.

Xylose and arabinase were separately administered p.o. as one dose after an 8 hr fast and again as a 10% solution i.v. over a 1 hr period to 12 healthy children (9 months to 4 yr of age). D-xylose was better metabolized when given i.v. (29% recovered from the urine versus 41% of the arabinase) and better absorbed when given p.o. (20% versus 9.9% recovery). Ten healthy children (9 to 13 months old) received the same amount of pentose with glucose (2 g/kg) 48 hr after administration of xylose p.o. Arabinase and glucose were given 1 week later. The absorption of xylose was significantly inhibited by glucose while arabinase was unaffected. The absorption of xylose was normal in children (14 months to 4 yr) with celiac disease who were on a gliadine-free diet and was significantly reduced by gliadine administration. Arabinase absorption was not influenced by gliadine but was lower in celiac disease.

3045 ABO BLOOD GROUPS, SECRETOR STATUS, AND INTESTINAL ALKALINE PHOSPHATASE CONCENTRATIONS IN PATIENTS WITH CELIAC DISEASE. *(E.)* Langman, M. J. S. (Dept. Med., U. Nottingham, England). J. G. Banwell, J. S. Stewart and E. B. Robson. *Gastroenterology* 57(1):19-23, 1969.

The incidence of ABO blood groups and ABH secretors together with serum intestinal alkaline phosphatase levels in 212 patients with celiac disease were compared with 63,000 controls. Differences were slight and intestinal alkaline phosphatase was unaltered in the presence of the disease. Any genetic predisposition to celiac disease is apparently not associated with these factors.

3046 ACTIVE COELIAC DISEASE IN CHILDHOOD. CLINICAL AND LABORATORY FINDINGS OF FORTY-TWO CASES. *(E.)* Hamilton, J. R. (Hosp. Sick Child., Toronto, Canada), M. J. Lynch and B. J. Reilly. *Quart J Med* 38(150):135-158, 1969.

3047 INTESTINAL PSEUDO-OBSTRUCTION WITH BACTERIAL OVERGROWTH IN THE SMALL INTESTINE. *(E.)* Pearson, A. J. (Southmead Hosp., Bristol, England), A. Brzechwa-Ajdukiewicz and C. F. McCarthy. *Amer J Dig Dis* 14(3):200-205, 1969.

3048 MALABSORPTION IN PATIENTS WITH PULMONARY TUBERCULOSIS TESTED WITH D-XYLOSE. *(Pol.)* Florkiewicz, H. (Acad. Med., Lublin, Poland), S. Grodzki and G. Horubala. *Pol Tyg Lek* 24(13):485-487, 1969.

3049 THE PLACE OF MEDIUM CHAIN TRIGLYCERIDES. [EDITORIAL] *(E.)* Senior, J. R. (Philadelphia Gen. Hosp., Penna.). *Amer J Med Sci* 257(2): 75-80, 1969.

3050 STEATORRHOEA AND INTRA-ABDOMINAL LYMPHOMA. *(E.)* Shreeve, D. R. (Dept. Path., Manchester U., England), P. Horrocks and A. R. Mainwaring. *Scand J Gastroent* 3(6):577-585, 1968.

3051 INTESTINAL MALABSORPTION. (A STUDY OF 22 CASES). *(Por.)* Berlin, S. O., G. Brant, C. G. Lofgren and S. G. Sjoberg. *Arq Hosp Santa Casa* 14(2): 87-90, 1968.

3052 MALIGNANCY AND ADULT COELIAC DISEASE. *(E.)* Cooke, W. T. (Gen. Hosp., Birminghan England), H. Thompson and J. Alexander Williams. *Gut* 10(2): 108-111, 1969.

3053 INTESTINAL DISACCHARIDASE ACTIVITY IN PSORIASIS VULGARIS. *(E.)* Madžarovová-Nohejlová, J. (2nd Inter. Clin., Charles U., Plzěn, Czechoslovakia) and M. Pokorný. *T Gastroent* 12(1):9-17, 1969.

3054 THE IMMUNOGLOBULINS OF INTESTINAL MUCOSA OF CHILDREN IN CELIAC DISEASE AND OTHER PATHOLOGICAL CONDITIONS. *(E.)* Nordio, S. (Dept. Pediat. U. Genoa, Italy), C. Borrone, A. G. Marchi and G. Vignola. *Helv Paediat Acta* 22(3):320-330, 1967.

3055 SJOGREN-LARSSON SYNDROME WITH EXUDATIVE ENTEROPATHY: INFLUENCE OF MEDIUM-CHAIN TRIGLYCERIDES ON THE SYMPTOMATOLOGY. [CASE REPORT] *(E.)* Hooft, C. (Dept. Pediat., State U., Ghent, Belgium), J. Kriekemans, K. van Acker, E. Devos, S. Traen and G. Verdonk. *Helv Paediat Acta* 22(5): 447-458, 1967.

3056 COELIAC DISEASE: A REVIEW. *(E.)* Townley, R. R. W. (Queen Victoria Hosp., Victoria, Australia) and C. M. Anderson. *Ergebn Inn Med Kinderheilk* 26:1-44, 1967.

3057 A CASE OF CONGENITAL LACTOSE INTOLERANCE WITH TRANSITORY LACTOSURI *(It.)* Centa, A. (Dept. Human Genetics, U. Genoa, Italy). *Minerva Pediat* 19(27):1376-1381, 1967.

3058 INTESTINAL PATHOLOGY OF TROPICAL SPRUE. *(E.)* England, N. W. J. (Eastern Command Lab., London, England). *Amer J Clin Nutr* 21(9): 962-975, 1968.

3059 **COMPARISON OF STAGNANT-LOOP SYNDROME WITH CHRONIC TROPICAL SPRUE.** *(E.)* Booth, C. C. (Postgrad. Med. Sch., London, England), S. Tabaqchali and D. L. Mollin. *Amer J Clin Nutr* 21(9):1097-1109, 1968.

See also: 2763,2823,2825,2861,2906,3022,3132,3200,3267

3060 NEUROAUTONOMIC DYSTONIA IN METAAMEBIC COLOPATHY: PSYCHOPATHOLOGICAL ASPECTS OF THE STUDY OF THE PERSONALITY. *(Fr.)* Dupre, N. (R. Picque Milit. Teaching Hosp., Bordeaux, France) and C. Jean-Jean. *Actualites Hepatogastroent Hotel Dieu* 5(1):B1-B10, 1969.

Based on laboratory, clinical and psychological studies of 34 male patients with a history of intestinal amebiasis dating back an average of 15.5 yr, the neuroautonomic dystonia seen in such patients is described as an intermediate stage between pure colitis and pure psychopathology. Studies of the heart rate, orthostatic stability and the response to ocular and abdominal compression revealed predominant vagotonia in 50% of these patients, amphotonia in 35%, and orthosympathetic tone in 15%; in patients with vagotonia, atropine therapy may be indicated. In over 50% of the cases, spasmophilia was noted which sometimes required magnesium therapy; finally, about 50% also showed histamine hypersensitivity. The Minnesota Multiphasic Personality Inventory indicated a compulsive type of neurosis in 48% and anxiety in 40%, with only 4 normal results out of 34. Projective Rorschach studies indicated a psychasthenic or obsessive personality in 42.8% and a generally hysterical personality in another 40%. Based on integrated study of the patient's personality and clinical symptoms, it is possible to distinguish those cases in which tranquilizers are indicated and those which will respond best to psychotherapy alone.

3061 A STUDY OF 250 CASES WITH TUMORS OF THE RECTUM AND SIGMOID. *(Fl.)* Vandamme, J. P. (St. Jozef Clin., Brugge, Belgium) and R. Maenhoudt. *Acta Chir Belg* 67(8):821-838, 1968.

Among 250 patients (56% male; 12-91 yr old, average 64.5) with primary carcinoma of the rectum and/or sigmoid colon (confirmed histologically in 80%) treated during the period 1948-66, most had had symptoms (constipation, abdominal pain, mucus discharge, bleeding, weight loss, diarrhea) for 7-8 months, 49% had a severe associated illness, 78% were still locally resectable, and 12% required extensive surgery. Although the approach was generally radical, only 74% were actually resected and only 50% were considered curable at time of operation. The postoperative mortality (30 days) was 4.3% among those resected, compared to 17.2% among those subjected to surgery in whom the tumor could not be excised. The 5- and 10-yr survivals for the entire group of patients were 51% and 29%, resp., but for the "curable" cases the comparable figures were 71% and 43%. Techniques employed included the Mikulicz resection (6%), low abdominal resection (6%), conventional resection with reanastomosis (24%), and abdominoperineal amputation of the rectum (50%). Complications which could be referred specifically to the operation included stenosis of the anastomosis, debridement of cicatricial tissue, fistula and abscess formation, adhesions, and hemorrhage. Radical surgery immediately after diagnosis is recommended for patients with malignancies of the large bowel.

3062 THE USE OF GENTAMICIN FOR PREOPERATIVE PREPARATION OF THE LARGE BOWEL. *(E.)* Houghton, G. W. (Prince Henry Hosp., Sydney, Australia). *Med J Aust* 1(19):796-799, 1968.

Sixteen patients undergoing colon surgery had routine mechanical as well as gentamicin (50 mg every 4 hr for 48 hr) bowel preparations. Pre- and post-treatment rectal cultures were obtained and plated on sodium azide blood, MacConkey's, Sabouraud's, tomato juice and mannitol-salt agars. Gentamicin was effective in eliminating most pathogenic bacteria and demonstrated *in vitro* activity against strains of staphylococci resistant to neomycin and kanamycin. There were no side effects attributable to gentamicin, but it allowed the overgrowth of yeast organisms in some instances. No systemic effects occurred in the cases studied.

3063 ACUTE APPENDICITIS IN A UNIVERSITY HEALTH SERVICE. OBSERVATION OF DOUBTFUL CASES IMPROVES DIAGNOSTIC ACCURACY WITHOUT INCREASING MORBIDITY. *(E.)* Perry, T. Jr. (Rhode Island Hosp., Providence). *Rhode Island Med J* 51(1): 34-37, 1968.

Among 72 male university students with a preoperative diagnosis of appendicitis, 1 patient had a perforated diverticulum, 1 regional enteritis, 2 mesenteric adenitis and 1 no pathology. Of 61 cases available for analysis, 53 were operated upon within 30 hr of their first symptoms and none who were observed for periods longer than 18 hr before hospitalization had ruptured appendices. Of 55 patients with unruptured appendicitis, 54 were discharged to classes within 10 days.

3064 SIGMOID VOLVULUS. *(E.)* Binns, F. (Royal Prince Alfred Hosp., Sydney, Australia). *Med J Aust* 1(20):846-848, 1968.

During a ten-yr review of intestinal obstruction, 20 cases of sigmoid volvulus (15 female and 5 male) were found representing 1.9% of the total cases. Pain averaging 3-4 days duration occurred in 16 cases, distention in 14, vomiting in 10 and constipation in 11. Physical examination revealed distention in 18 and tenderness in 4. Five patients were admitted in shock and 3 of these died. X-ray findings were typical of volvulus in 10 cases. A Paul-Mikulicz procedure was performed in 7 cases, resection and end-to-end anastomosis in 7, laparotomy with aspiration and untwisting in 2 and a rectal tube passed and subsequently guided into the colon at surgery in 1 case. Ten of the 17 patients who received operative treatment developed complications, and the overall mortality in the series was 30%.

3065 INCISIONAL HERNIAS AS A FUNCTION OF AGE. *(E.)* Viljanto, J. (U. Turku, Finland) and E. Vänttinen. *Ann Chir Gynaec Fenn* 57(2):246-249, 1968.

Eighty-eight patients reevaluated 3 to 7 yr after abdominal surgery and found to have incisional hernias were compared with patients with peptic ulcer procedures and gallbladder surgery for the same postoperative yr. In 1 yr the age and sex distribution of appendectomized patients was recorded. After cholecystectomy males seemed to have incisional hernias 5 times as often, and after partial gastrectomies 4 times as often as females. After appendectomies, hernias were twice as common in males. The McBurney incision, even when infected, was the safest abdominal incision followed by the upper midline and transrectal incisions. Twenty of 24 patients with incisional hernias after cholecystectomy were sutured with chromic catgut. The ages of patients with hernias after peptic ulcer surgery, cholecystectomy, and appendectomy were apparently 10, 7, and 20 yr more than average. The youngest patient with an incisional hernia after a noninfected cholecystectomy incision was 40, in the partial gastrectomy group 43, and at appendectomy 39. Renal function was normal in all the cases, but there were 4 times as many external hernias as in the controls. Of the whole group of 88 hernias, 36 occurred after wound infection.

3066 TENIECTOMY FOR COLONIC ELONGATION (NAJAFI-BEATTIE PROCEDURE). *(E.)*

Hovnanian, A. P. (St. Francis Hosp., Evanston, Ill.) and R. Prudencio. *Int Surg* 50(1):149-154, 1968.

Measurements of normal colon sections obtained at the autopsy of 48 unselected patients were made before and after the excision of tenia coli. The ascending, descending, transverse and pelvisigmoid colons all showed elongation after the removal of at least one tenia. The average elongation after triple tenectomy for the entire colon was 21.5 cm, after dual tenectomy 7.5 cm, and after single tenectomy 5.2 cm.

3067 CLINICAL ASPECTS OF CONGESTIVE PROCTITIS. *(It.)*

Muratori, F. (Turin Gen. Hosp., Italy) and F. Presti. *Minerva Gastroent* 14(4):237-241, 1968.

A survey of 568 patients (313 males and 255 females) subjected to rectoscopy revealed in 256 (45%) diffuse congestive proctitis. In 25.7% (29 males and 37 females) the proctitis was primitive, in 43% (67 males and 44 females) it was hemorrhoidal, in 11% (20 males and 9 females) it was hemorrhoidal associated with other pathologic conditions of the large intestine, in 19% (22 males and 28 females) it was hemorrhoidal, associated with other pathologic conditions (allergy, ionic radiation injury, diverticulosis, prostatic hypertrophy, uterine fibromatosis, and fecaloma). Symptomatology was asthenia, pain, anal itching, anemia, mucous hypersecretion, alteration of alvus, proctorrhagia. The endoscope picture was characterized by red cyanotic mucosa, hypersecretion of mucus, and hemorrhagic phenomena. Histologic examination showed lymphomonocitic infiltrations in tunica propria, dilatations of capillary vessels, muciparous hyperactivity, erosions of mucosa.

3068 SOME OBSERVATIONS ON 1091 RECTOSCOPIES. *(It.)*

Saracco, C. (Inst. Clin. Gen. Med., U. Turin, Italy), R. Bertero and G. Bruno. *Minerva Gastrent* 14(4):230-236, 1968.

Rectoscopies were performed on 1091 patients (699 males and 422 females). Rectal bleeding was present in 60.7%; anorectal symptomatology in 35.9%; abdominal pain in 32.8% diarrhea in 28.9%, loss of weight in 27.7%, stypsis in 16.1%; and melena in 2.8% of the patients. Results revealed normal conditions in 27.2%; tumors (mainly within 18 cm. of the anal orifice) in 12.9%; ulcerous rectocolitis in 7.3%; polyposis in 5.1%, sigmoiditis in 4.4%; proctosigmoiditis in 3.5%; stenosis in 1.4%; solitary ulcers in 0.6%; granuloma in 0.2% of the patients. The analysis of the symptomatology in association with proctologic conditions failed to reveal any unequivocally characteristic symptoms, except for ulcer-hemorrhagic rectocolitis, in which the symptoms: diarrhea, rectal bleeding, and abdominal pain were present in almost 100% of cases.

3069 SYMPATHETIC INNERVATION OF THE COLON IN HIRSCHSPRUNG'S DISEASE: A HISTOCHEMICAL STUDY. *(E.)*

Ehrenpreis, T. (Dept. Histol., Karolinska Inst., Stockholm, Sweden), K. A. Norberg and C. Wirsén. *J Pediat Surg* 3(1):43-49, 1968.

Rectosigmoidectomy specimens from 10 patients with Hirschsprung's disease were studied histochemically by a fluorescence technique, permitting selective visualization of adrenergic nerve terminals. In histologically normal segments of bowel, synaptic arborizations around the intrinsic ganglia were present and had the same appearance as demonstrated earlier in several animal species. In aganglionic bowel, no adrenergic synapses were found. These findings imply that the mediation of not only parasympathetic but also sympathetic influences to aganglionic bowel are interrupted. Functional denervation promotes spastic contraction, which is the main characteristic of the distal aganglionic segment of bowel in Hirschsprung's disease.

3070 THE RESULTS OF 53 RIGHT HEMICOLECTOMIES FOR NONCANCEROUS LESIONS. *(Fr.)*

Peycelon, R. (Surg. Clin. B, Fac. Med. Lyon, France), X. Delore and B. Croizat. *Lyon Chir* 65(1):36-54, 1969.

Right hemicolectomy, rather than conservative or temporary surgery, was performed in 53 cases during the period 1943-67. In all but one case (perforation of the ileal loop 12 yr after ileotransversostomy), the right hemicolectomy was performed as a single-stage procedure, the technique for which is described in detail. The principal indications for this operation were: nonspecific inflammatory granulomas (16 cases), stercoral fistulas (8 cases), ileocecal tuberculosis (7 cases), Crohn's disease of the colon (5 cases), surgical injuries to the ileocecal segment (4 cases), lesions of the terminal ileum, volvulus or invagination of the right colon, benign tumors of the mesentery and mesocolon, intestinal infarction, and postoperative peritonitis. The main postoperative complications were fistula formation (5 cases), occlusion (3 cases), and thromboembolism (3 cases), but in 30 cases the postoperative course was smooth with an average hospital stay of only 23 days. The postoperative mortality was 13.2%, but 3 of the 7 deaths could not be ascribed to the type of surgery performed; the mortality rate increased sharply with age over 70. The diagnosis and long-term results in each type of condition are discussed, with brief case reports, and it is pointed out that the functional results were generally excellent.

3071 INTRAUTERINE GROWTH RATE IN RELATION TO ANORECTAL AND OESOPHAGEAL ANOMALIES. *(E.)*

Cozzi, F. (Hosp. Sick Child., London, England) and A. W. Wilkinson. *Arch Dis Childh* 44(233):59-62, 1969.

Between 1958 and 1967, 168 babies less than 1 month old were observed with esophageal and/or anorectal anomalies. They were divided into three groups: 75 (50 boys and 25 girls) with anorectal anomalies only, 76 (39 boys and 37 girls) with esophageal anomalies, and 17 (9 boys and 8 girls) with both. The incidence of prematurity (gestation of less than 38 weeks) was 6.6%, 10.5% and 47% in the 3 groups. A total of 54 babies had birth weights of 2500 g or less, and 27 of these had normal gestation periods. Intrauterine growth retardation was noted in 12%, 21% and 11%, resp. Compared to premature infants, the low-birth-weight babies with normal gestation periods had a lower mortality rate, but a higher incidence of hydramnios and twinning.

3072 **NONMETASTATIC CUTANEOUS MANIFESTATIONS OF CANCER OF THE COLON.** *(E.)* Rosato, F. E. (U. Pennsylvania Sch. Med., Philadelphia), W. B. Shelley, W. T. Fitts Jr. and L. D. Miller. *Amer J Surg* 117(2): 277-281, 1969.

A review of 1084 cases of colonic cancer seen over a 15-yr period revealed 5 cases (1 man and 4 women, 49-76 yr old) with nonmetastatic cutaneous lesions. Three of the patients had erythema multiform, one had the skin lesions of dermatomyositis, and one had a nonspecific dermatitis. Four of the 5 presented initially with their cutaneous manifestations, while the other had simultaneous skin and bowel complaints. A tumor antigen is postulated as being responsible for the associated dermatological condition.

3073 **EXPERIENCE WITH PARTIAL RESECTION OF THE PUBORECTALIS MUSCLE.** *(E.)* Wallace, W. C. (Greenville, S. C.) and W. M. Madden. *Dis Colon Rectum* 12(3):196-200, 1969.

Thirty-three adults and 13 children underwent partial resection of the puborectalis muscle to correct increasing constipation, impaction, soiling, incontinence and inability to evacuate the rectum in spite of training. Preoperative X-rays ruled out organic disease. Tissue reports showed fibrosis and, occasionally, hypertrophy of the skeletal muscle. General improvement was noted, and the procedure is highly recommended, although the follow-up period has so far not exceeded 2-3 yr.

3074 **CROHN'S COLITIS.** *(E.)* Stening, G. F. (Royal Prince Alfred Hosp., Sydney, Australia). *Med J Aust* 1(20):841-843, 1968.

In 10 yr 18 patients were seen with Crohn's colitis; 11 were under 40 and 7 were over 50. Thirteen of the 18 had diffuse colitis and 9 of these also had involvement of the terminal ileum. Four of the other 5 had single strictures, and 1 multiple narrowings. None had disease confined to the distal colon. The female to male ratio was 2:1 and the presenting symptoms were diarrhea and colicky abdominal pain in 14, anal lesions in 2, and rectal bleeding in 2. Anal lesions were diagnostic in 4 of 7 patients biopsied. All 18 patients had laparotomies, with bowel resection in 17 and mesenteric lymph node biopsy in 1. Rectal biopsies were nondiagnostic in 3 patients with rectal involvement. The disease appears to run an indolent course in those over 50 while it resembles Crohn's disease of the small bowel in those under 50. Operative mortality in the series was 11%.

3075 **APPENDECTOMY AND CANCER RISK.** *(E.)* Hyams, L. (Rutgers Med. Sch., New Brunswick, N. J.) and E. L. Wynder. *J Chronic Dis* 21(6):391-415, 1968.

An extensive, epidemiologically oriented questionnaire was administered to 1582 subjects (900 males, 682 females) with and without cancer and another was self-administered by 700 healthy young persons in order to assess cancer risk following appendectomy. Men with Hodgkin's disease evidenced significantly higher rates of appendectomy than controls. No other firm correlations between appendectomies and cancer were made. An appendectomy procedure itself was directly related to race (Negro only 5.8% incidence) and to other abdominal operations in males and to American birth, increasing educational levels, increased socio-economic status, private hospital accomodations and abdominal operations in women.

3076 **STRANGULATED INGUINAL HERNIA IN THE NEONATAL PERIOD.** *(E.)* Cartledge, J. McP. (Alder Hey Child. Hosp., Liverpool, England). *Aust Paediat J* 4(3):196-199, 1968.

In the course of 11 years, 2015 children were operated upon for inguinal hernia. Of these, 140 (7%) were strangulated, and 33 (1.6%) were less than 1 month old. Reduction of the strangulated hernia by taxis was successful in 14 cases, unsuccessful in 6 and was not attempted in 13 because of signs of intestinal obstruction, or because the inguinal swelling was extremely tender. There was no relationship between length of history and the success or failure of taxis. Herniotomy was performed either urgently or subsequently on every child. Gangrene of the intestine requiring resection occurred in only 1, the related testicle was infarcted in 1, and the testis was engorged but viable in 5 others. There were 2 deaths, neither of which was directly connected with the hernia.

3077 **EPIDERMOID CARCINOMA OF THE PERIANAL SKIN AND ANAL CANAL.** *(E.)* Kuehn, P. G. (85 Jefferson St., Hartford, Conn.), H. Eisenberg and J. F. Reed. *Cancer* 22(5):932-938, 1968.

A tumor registry review of 30 years revealed 200 cases with a diagnosis of cancer of the anus. Of 189 (average age 60) with an adequate follow-up 112 were women and 77 men. Frequent diffuse metastases were present in 42 cases where there was a delayed diagnosis. Rectal bleeding (109), rectal pain (66), the sensation of an anal mass (29), and male pruritus (17) were the common symptoms. The mucocutaneous junction (109 cases) was the most common primary site and was associated with almost all hepatic and pulmonary metatases. The absolute 5-yr survival rate in all patients with inguinal metastases was below 5%. In those with radical groin dissections it was 20%. When inquinal nodes were positive at the initial visit none survived 5 yr. The overall 5-yr-survival rate for all forms of therapy in all anal carcinoma cases was 46%. These included local excision (75.2% survival), abdominal perineal resection (46.8%), local excision and radiation (20%) and radiation alone (20%).

3078 **INTESTINAL VESICAL FISTULA.** *(E.)* Scardino, P. L. (Savannah Urological Clin., Ga.) and W. H. Lippitt. *Trans Amer Ass Genitourin Surg* 59:84-90, 1967.

Five cases are presented which justify the conclusion that primary bowel resection is the treatment of choice except for that fistula which communicates with a 3rd organ. Attention to the fistula was in all cases directed by the urinary symptoms, confirmed by cystoscopic examination and supported in part by X-ray of the bowel. Hospitalization has been significantly educed by primary resection. The history, physical examination and cystoscopy were useful in diagnosis, but little information was obtained from X-ray studies of urinary barium sediment after barium enema. Studies with various dyes were unuccessful.

3079 SIMULTANEOUS ABDOMINOTRANSSACRAL RESECTION AND ANASTOMOSIS FOR MID-RECTAL CANCER.

(E.) Localio, S. A. (New York U. Sch. Med., N. Y.) and W. M. Stahl. *Amer J Surg* 117(2):282-289, 969.

Fifteen patients (8 males and 7 females, 42 75 yr-old with an verage of 61.3) had abdominotranssacral procedures for rectal arcinomas 6-12 cm from the anal verge. The descending colon was anastomosed to the distal colon without diverting colostomies. All patients survived the short follow-up (1.5-17 months) nd had normal defecation sensations. Operative complications ncluded 2 anastomotic leaks necessitating transverse colostomies, one leak with pelvic abscess requiring a colostomy, and a late posterior fecal fistula which closed spontaneously. In the absence of long-term studies, however, the procedure must be considered experimental and highly selective.

3080 INTESTINO-VESICAL FISTULA.

(E.) Lindstedt, E. (Dept. Surg., U. Lund, Sweden). *Scand J Urol Nephrol* 1(3):253-258, 1967.

Fourteen cases (12 male and 2 female patients, ranging in age from 2-69 yr) of acquired intestino-vesical fistula were studied. Ten of the 14 fistulae arose from the sigmoid colon. The etiology was diverticulitis in 7 patients, carcinoma of the sigmoid colon in 3, actinomycosis of the cecum in 1, and regional enteritis in 1. The other 2 cases occurred after surgery; 1 after transvescical prostatectomy for prostatic carcinoma, not diagnosed preoperatively, and the other following partial intestinal resection for Hirschsprung's disease. Cystoscopy demonstrated the fistula in 7 patients, strongly suggested it in 2, but failed to show it in 3. Roentgen examination of the colon revealed the fistula in only 4 cases. Six of the patients were referred with a diagnosis of suspected bladder tumor. The operation was usually performed in 3 stages: colostomy, resection, and closure. The prospect of healing is favorable if the renal damage is not too far advanced. A carcinoma of the sigmoid with a fistula to the urinary bladder need not be inoperable. Three of 12 patients are well 5 yr postoperatively, and the 3 patients with cancer of the sigmoid are well 2, 3, and 5 yr postoperatively

3081 DIVERTICULOSIS, DIVERTICULITIS, AND DIABETES: A REVIEW OF 740 CASES.

(E.) Schowengerdt, C. G. (U. Cincinnati Med. Ctr., Ohio), G. R. Hedges, P. B. Yaw and W. A. Altemeier. *Arch Surg* 98(4): 500-504, 1969.

In a review of 740 patients with diverticular disease of the colon (206 with diverticulitis and 534 with diverticulosis), the incidence of diabetes mellitus was found to be more than twice as high in diverticulitis (22.8%) as in diverticulosis (10.5%). When diabetes was coexistent with diverticulitis, the following alterations were observed in the manifestations of diverticulitis: appearance at a later age; a shorter symptomatic course; greater involvement of the female; a greater incidence of bleeding and fistula formation; and a higher mortality (19.1% and 10.7%, resp.). Diabetes should be suspected in those patients with major complications of diverticulitis and appropriate treatment should be instituted if it is present.

3082 TREATMENT OF MASSIVE DIVERTICULAR HEMORRHAGE.

(E.) Taylor, F. W. (Marion County Gen. Hosp., Indianapolis, Ind.) and L. I. Epstein. *Arch Surg* 98(4):505-508, 1969.

Some reports suggest that emergency colonic resection is the treatment of choice in patients with massive diverticular hemorrhage. A review of 76 consecutive cases, however, provides a strong argument against early and aggressive operative management and favors a more conservative approach. Thus, 47% (8 of 17) of those operated on died compared to only 2 of 59 treated conservatively with blood transfusions. Recurrent hemorrhage occurred in 30%. The amount of blood required could be used as a basis for judging the severity in both operated and unoperated bleeders.

3083 SURGICAL MANAGEMENT OF COLONIC DIVERTICULITIS WITH FREE PERFORATION OR ABSCESS FORMATION.

(E.) Rodkey, G. V. (Massachusetts Gen. Hosp., Boston) and C. E. Welch. *Amer J Surg* 117(2):265-269, 1969.

The treatment of 50 patients with diverticulitis of the colon and either extensive free perforation (15 men and 13 women) or gross abscess formation (9 men and 13 women) was evaluated to establish the most effective surgical approach. Although the age range was 17-82 yr, 22% were between the ages of 17 and 40; 76% had had symptoms for less than one week and in 68% there had been no preceding chronic bowel symptoms. Two of 34 patients having three-stage procedures died, as did one subjected to exploratory laparotomy. For the remainder, the length of the hospital stay averaged 62.3 days with a total morbidity of 7.6 months. Two patients treated by exteriorization of the perforated segment averaged 79 days of hospitalization and 18 months morbidity. Two patients treated by primary resection and anastomosis averaged 27.5 days in the hospital and 2 months morbidity. It is concluded that primary excision, bringing the proximal loop out as a colostomy and closing or exteriorizing the distal loop, combines the safety of the staged operations with the advantages of immediate extirpation of the diseased bowel.

3084 ATRESIA OF THE COLON.

(E.) Coran, A. G. (Child. Hosp. Med. Ctr., Boston, Mass.) and A. J. Eraklis. *Surgery* 65(5):828-831, 1969.

The clinical course and findings in 9 infants (5 boys and 4 girls) with colonic atresia are presented. Physical examination showed abdominal distension of varying degrees and no meconium in the rectal ampulla. A flat plate and upright X-ray of the abdomen showed a high degree of mechanical, low intestinal obstruction with multiple air-fluid levels. A barium enema, carried out preoperatively in 3 of the 9 infants, revealed a microcolon distal to the sigmoid colon in 1, atresia at the hepatic flexure in another, and an entire microcolon in the third. In 1 infant with cecal atresia, a resection with primary ileocolic anastomosis was carried out. The other 8 infants were treated by a Mikulicz colostomy or ileocolostomy as a temporary procedure. A closure of the temporary enterotomy was performed at a later time. Six of the 9 infants survived. Two of the three deaths occurred late in the clinical course following successful closure of the Mikulicz colostomy.

3085 **THE ILEOPTOMISTS OF CHICAGO.** *(E.)* Sparberg, M. (Northwestern U. Med. Sch., Chicago, Ill.). *Chicago Med* 71(8):291-292, 1968.

3086 **CONGENITAL HERNIATION OF THE LARGE BOWEL INTO THE PERICARDIAL CAVITY. SURVIVAL INTO ADULTHOOD DESPITE A GENERALIZED CONNECTIVE TISSUE DISORDER.** *(E.)* Moss, A. J. (U. Rochester Sch. Med., N. Y.) and D. J. Harris. *Dis Chest* 55(4): 301-305, 1969.

3087 **PULMONARY INFILTRATIONS WITH EOSINOPHILIA AS A MANIFESTATION OF CARCINOMA.** *(E.)* Boone, A. W. (USAF Hosp., Great Falls, Montana). *Dis Chest* 55(4):341-344, 1969.

3088 **MANAGEMENT OF ACUTE PAIN SYNDROME OF THE ANUS.** *(Fr.)* Chabanon, M. R. *J Med Lyon* 50(1157):127-133, 1969.

3089 **TRANSVERSE COLONIC ISCHEMIC STENOSIS.** *(Fr.)* Sarris, M. (Hippocrates Hosp., Athens, Greece) and P. Poungouras. *Ann Chir* 22(23/24):1341-1345, 1968.

3090 **ACQUIRED DIVERTICULA OF THE APPENDIX.** *(Rus.)* Kaliteevskii, P. F. (Munic. Hosp. Clin. No. 67, Moscow, USSR). *Arkh Pat* 30(12):48-54, 1968.

3091 **FACTORS INFLUENCING MORTALITY RATES IN APPENDECTOMY.** *(Sp.)* de la Fuente Bradley, H. (Hosp. Viña de Mar, Chile). *Rev Med Valpar* 21(4):103-105, 1968.

3092 **LARGE INTESTINE OBSTRUCTION BY ENDOMETRIOSIS.** *(Sp.)* Villagrán, A. V. (Carlos van Buren Hosp., Valparaíso, Chile), C. L. Silva and H. Apablaza. *Rev Med Valpar* 21(4):129-131, 1968.

3093 **COLON PREMALIGNANT?** *(E.)* Prohaska, J. V. (U. Chicago Sch. Med., Ill.). *Postgrad Med* 45(3): 217-220, 1969.

3094 **ENTEROGENOUS PHLEGMONS OF THE SIGMOID.** *(Rus.)* Teitel'baum, I. B. (United Hosp. Kalinin Region, Leningrad, USSR). *Khirurgiia (Moskva)* 45(1): 85-89, 1969.

3095 **GARDNER'S SYNDROME: A CHALLENGE IN CANCER PREVENTION.** *(E.)* Johnson, J. G. (West Virginia U. Med. Ctr., Morgantown), A. L. Watne and B. Zimmermann. *Med Times* 97(4):151-157, 1969.

3096 **THE IMPORTANCE OF NEUROHISTOLOGICAL STUDY IN ACUTE APPENDICITIS.** *(Rus.)* Mitasov, I. G. (Kharkov Med. Inst., USSR). *Khirurgiia (Moskva)* 45(1):89-94, 1969.

3097 **SIMPLE ULCERS OF THE COLON AND RECTUM.** *(Sp.)* Ruiz Ochoa, V. (Fac. Med., Santiago de Compostela, Spain), J. Potel Lesquereux and J. L. Puente Dominguez. *Rev Esp Enferm Apar Dig* 27(10):1467-1473, 1968.

3098 **COLOSTOMIES: A GUIDE FOR THE PATIENT.** *(E.)* Lennenberg, E. (New England Deaconess Hosp., Boston, Mass.) and A. N. Mendelssohn. *Dis Colon Rectum* 12(3):201-217, 1969.

3099 **FURTHER STUDIES OF THE MANAGEMENT OF PRURITUS ANI.** *(E.)* Brooks, L. H. (Cleveland, Ohio). *Dis Colon Rectum* 12(3):193-195, 1969.

3100 **MEGACOLON IN ADULTS.** *(E.)* Hughes, E. S. R. (Royal Melbourne Hosp., Australia), K. J. Hardy and A. M. Cuthbertson. *Dis Colon Rectum* 12(3):190-192, 1969.

3101 **ANOPLASTY–WHAT, WHEN, HOW, WHY.** *(E.)* Laird, D. R. (Amer. Proctol. Soc., Denver, Col.), N. J. Campbell, C. E. Hardwick, W. A. McMahon and E. D. Parkinson. *Dis Colon Rectum* 12(3):179-189, 1969.

3102 **SURGICAL JUDGMENT AND COLONIC ANASTOMOSES.** *(E.)* Hunt, T. K. (San Francisco Gen. Hosp., Calif.) and P. R. Hawley. *Dis Colon Rectum* 12(3):167-171, 1969.

3103 **CROHN'S DISEASE OF THE LARGE INTESTINE.** *(It.)* D'Afflitto, V. (Elena d'Aosta Hosp., Naples, Italy), L. Baffa and G. P. Jori. *Rass Int Clin Ter* 48(21):1312-1321, 1968.

3104 **DIFFUSE POLYPOSIS OF THE RECTUM AND COLON.** *(It.)* Pisani, P. (United Hosp. Naples, Italy), V. Galloro and L. De Tommasis. *Rass Int Clin Ter* 48(21):1338-1350, 1968.

3105 **ENDOMETRIOSIS OF THE RECTOSIGMOID AREA: CLINICAL AND HISTOPATHOLOGICAL CONSIDERATIONS.** *(It.)* Repossini, L. (Munic. Hosp., Legnano, Italy) and E. Strobino. *Chir Ital* 20(1):137-148, 1968.

3106 **PROBLEMS POSED BY SPHINCTER INCONTINENCE IN ELDERLY SUBJECTS.** *(Fr.)* Monod-Broca, P. *Rev Franc Geront* 14(5):239-242, 1968.

3107 **PSEUDOTUMOR OF THE LARGE INTESTINE PRODUCED BY A FOREIGN BODY.** *(Ser.)* Sokačić, F. (Med. Ctr., Vukovar, Yugoslavia). *Lijecn Vjesn* 90(8):755-760, 1968.

3108 **LIGATION TREATMENT OF HAEMORRHOIDS IN THE SURGERY: AN APPRAISAL.** *(E.)* Muir, D. (Dept. Surg., U. Tasmania, Australia). *Med J Aust* 1(5):213-215, 1969.

3109 **COLON ILEUS ASSOCIATED WITH LOW SPINE DISEASE.** *(E.)* Melamed, M. (Grant Hosp., Chicago, Ill.), S. E. Rabushka and J. L. Melamed. *Clin Radiol* 20(1):47-51, 1969.

3110 **PRIMARY ACTINOMYCOSIS OF THE TRANSVERSE MESOCOLON.** *(E.)* Palmisano, D. J. (Tulane U., Sch. Med., New Orleans, La.) and D. J. Russin. *Milit Med* 134(4):281-283, 1969.

3111 **DRUG RESISTANCE AND R FACTORS IN THE BOWEL BACTERIA OF LONDON PATIENTS BEFORE AND AFTER ADMISSION TO HOSPITAL.** *(E.)* Datta, N. (Royal Postgrad. Med. Sch., London, England). *Brit Med J* 2(5654):407-411, 1969.

3112 **TECHNIQUES OF APPENDECTOMY IN OBSTETRICS AND GYNECOLOGY.** *(E.)* Jovanovic, D. (Dept. Obstet. Gynec., U. Chicago, Ill.). *J Reprod Med* 2(5):251-255, 1969.

3113 **NON-PERFORATED APPENDICITIS PRESENTING AS SHOCK AND LIVER ABSCESS.** *(E.)* Grayer, S. P. (Walson Army Hosp., Fort Dix, N. J.). *Amer Surg* 35(6):461-462, 1969.

3114 **CARCINOMA OF THE LEFT COLON PRESENTING AS SURGICAL EMPHYSEMA.** *(E.)* Beesley, W. N. (Sir Patrick Dun Hosp., Dublin, Ireland) and R. D. Quill. *J Irish Med Ass* 62(381):94-96, 1969.

3115 **ANORECTAL PRODROMES AS MANIFESTATION OF CROHN'S ILEOCOLITIS.** *(E.)* Scharf, V. (Mount Sinai Hosp., Cleveland, Ohio). *Ohio Med J* 65(5):490-491, 1969.

See also: 2656,2742,2826,2853,2876,2914,2958,2959,2984,2992

3116 VASCULAR RESISTANCE OF THE RECTAL MUCOSA IN PATIENTS WITH ULCERATIVE COLITIS. *(Dan.)* Binder, V. (Copenhagen County Hosp., Gentofte, Denmark). *Ugeskr Laeger* 130(4):125-129, 1968.

Using a new technique based on the extent and rapidity of bleeding from the mucosa under a suction pressure of 200 mm Hg, as seen with a specially equipped rectoscope, the rectal bleeding tendency (capillary fragility) was measured 128 times in 77 patients (33 men and 44 women, average age 35.3 yr) with ulcerative colitis, as well as in 50 control subjects (15 men and 35 women, average age 47.7 yr) with a macro- and microscopically normal rectal mucosa (although 14 had an "irritable colon" syndrome) and 31 patients with various types of colonic inflammation other than ulcerative colitis (Crohn's disease, salmonellosis, diverticulitis, enterocolitis, polyps, anal fissures, etc.). Increased capillary fragility in the rectal mucosa was limited almost entirely to patients with ulcerative colitis, and was generally proportional to the degree of inflammation except in the group with inactive colitis, of whom 40% had increased capillary fragility and 60% had a normal vascular resistance. The possibility of a pathogenetic difference between these two subgroups is discussed. A slight increase in capillary fragility was also seen in a few patients with acute infectious enterocolitis.

3117 THE SURGICAL TREATMENT OF ULCERATIVE COLITIS IN CHILDHOOD. A STUDY OF 38 CASES. *(E.)* Schneider, K. M. (Mount Sinai Sch. Med., New York, N. Y.), J. M. Becker, B. I. Korelitz, I. H. Krasna and A. E. Kark. *J Pediat Surg* 3(1):12-18, 1968.

Of 38 children operated on for ulcerative colitis (22 boys and 16 girls; 16 yr or younger), 23 underwent surgery after steroids were administered and 15 were operated upon before steroid treatment. Steroids did not increase the interval between disease onset and necessity for surgery, but did change the indications for surgery. In the 15 steroid post-surgery cases, surgery for acute exacerbation was indicated in 11 (73%) and for chronic invalidism in 4 (27%). In the 23 children receiving steroid treatment, surgery for acute exacerbation was indicated in 9 (39%) and for chronic invalidism in 14 (61%). Ileostomy and subtotal colectomy was the most common operation (25 cases). Seven patients had total resection of the colon and rectum in one stage. There were no deaths following these extensive procedures performed in the 19 cases in the past 10 yr. The overall mortality was 13% and there was no difference in the steroid pre- or post-surgery groups.

3118 HEPATO-BILIARY PATHOLOGY IN ULCERATIVE COLITIS. *(It.)* Mazzacca, G. (Inst. Spec. Med. Path., U. Naples, Italy) and G. P. Jori. *Epatologia* 14(2): 115-125, 1968.

Anatomical and functional conditions of the liver were examined in 6 patients with ulcerative colitis during a 5-yr period. Results showed 2 to be suffering from clinically unsuspected liver disorders. One case had diffuse, marked liver steatosis, and the other chronic hepatitis with pericholangitis. These 2 diseases are probably the most frequent liver disorders found in ulcerative colitis. Less frequently found are: cholangitis, postnecrotic cirrhosis and biliary carcinoma. The incidence of cirrhosis in ulcerative colitis varies from 1.5% to 19%; the predominating type being postnecrotic.

3119 PRESERVATION OF CONTINENCE AFTER MUCOSAL GRAFT IN THE RECTUM AND ITS FEASIBILITY IN MAN. *(E.)* Glotzer, D. J. (Tufts U. Sch. Med., Boston, Mass.) and B. G. Pihl. *Amer J Surg* 117(3): 403-409, 1969.

In 5 mongrel dogs, partial colectomy with sphincter preservation was accomplished by combined mucosal stripping per rectum and abdominal resection, replacing the rectal mucosa with mucosa from the upper colon. There was one death due to sepsis but the other 4 dogs were continent within 3 weeks. Anorectal responses were present in all survivors and at autopsy there was good adherence of the mucosal isograft. Case reports are also presented for 2 patients with ulcerative colitis who had total abdominoperineal colectomies with rectal reconstruction using ileal mucosa. The first was unsuccessful because of a postoperative stricture, but the second was successful.

3120 IDIOPATHIC ULCERATIVE COLITIS AND ILEOCOLITIS. 11 CASES. *(Fr.)* Vachon, A. (Lyon, France), P. Paliard, J. Gauthier, R. Tete and Guillaud. *Arch Franc Mal Appar Dig* 58(3):101-128, 1969.

Idiopathic ulcerative ileocolitis may be defined anatomically by the existence of multiple and diffuse ulcerations with inflammation and edema of the submucosa affecting the right half of the colon. However, the distribution of the lesions makes it possible to distinguish 3 types: ileocolic, on the right colic segment, and rectocolic. The rectocolic type is often transitional toward a regular hemorrhagic rectocolitis, but in the others the rectum is either unaffected or only slightly. The 11 cases presented in detail fall into the 3 categories: ulcerative ileocolitis in 5, segmental ulcerative colitis without rectal involvement in 4, and rectocolitis in 2. Clinical symptoms resemble an acute or subacute colitis: serious diarrhea refractory to symptomatic treatment, fever, and malaise. Hemorrhage and dysentery-like symptoms are absent. Ulcerative colitis is usually more serious than hemorrhagic rectocolitis: remissions are rare and incomplete; complications (e.g., perforations, colectasia) are possible; and the failure of medical treatment often leads quickly to surgery (performed in 7 of 11 cases reported) which usually yields good results. Some cases, particularly those in which the terminal ileum is involved, are similar to Crohn's disease. Some are difficult to classify.

3121 CARCINOMA OF THE TERMINAL ILEUM AND SARCOIDOSIS IN A CASE OF ULCERATIVE COLITIS. *(E.)* Jalan, K. N. (Western Gen. Hosp., Edinburgh, Scotland), N. MacLean, J. M. Ross, W. Sircus and S. T. G. Butterworth. *Gastroenterology* 56(3):583-588, 1969.

3122 ULCERATIVE COLITIS. *(E.)* Aylett, S. O. (Gordon Hosp., London, England). *Postgrad Med* 45(4):176-178, 1969.

123 **GASTRO-COLIC FISTULA AS A COMPLICATION OF CHRONIC ULCERATIVE COLITIS.** *.)* Jones, R. S. (St. Joseph's Hosp., Reading, Pa.). *Med Rec*)(6):171, 1969.

124 **NATURAL ISO-ANTIBODIES SPECIFIC FOR TISSULAR GROUP ANTIGENS OF THE COLON N DOG AND RABBIT.** *(E.)* Zweibaum, A. (Broussais Hosp., aris, France) and V. Steudler. *Nature* 223:84-86, 1969.

125 **THE RESPONSE TO PSYCHOTHERAPY IN CHRONIC ULCERATIVE COLITIS. II. FACTORS ARISING FROM THE THERAPEUTIC SITUATION.** *(E.)* Karush, A. (Coll. Phys. Surg., Columbia U., New York, N. Y.), G. E. Daniels, J. F. O'Connor and L. O. Stern. *Psychosom Med* 31(3):201-226, 1969.

3126 **PORTAL BACTEREMIA IN CASES OF ULCERATIVE COLITIS SUBMITTED TO COLECTOMY.** *(E.)* Eade, M. N. (United Birmingham Hosp., England) and B. N. Brooke. *Lancet* 1(7603):1008-1009, 1969.

3127 **INDICATIONS FOR COLECTOMY IN ULCERATIVE COLITIS.** *(Dut.)* Hellemans, N. (Clin. Intern. Med., State U., Groningen, Netherlands). *Acta Chir Belg* (Suppl. 2):120-128, 1967.

3128 AN EXPERIMENTAL STUDY OF SUTURELESS CLOSURE OF WOUNDS IN THE PANCREATIC PARENCHYMA. *(Ger.)* Neef, H. (Surg. Clin., Martin Luther U., Halle-Wittenberg, Germany), K. P. Preusser, H. D. Wöllenweber and H. J. Bunge. *Bruns Beitr Klin Chir* 216(7): 651-658, 1968.

Healing of the pancreatic parenchyma following partial pancreatectomy (wedge-shaped excision of 5 cm of the tail of the pancreas, plus resection of the uncinate process in 6 cases) was compared in 26 dogs, including 15 in which the cut surfaces were treated with the tissue adhesive methyl-2-cyanoacrylate before compression; in the case of uncinate-process resection, the surfaces were also covered with native or lyophilized peritoneum to prevent hemorrhage. The animals were examined by relaparotomy or autopsy at 30 min, 2 and 8 days, and 3, 8, 9 and 15 weeks. In animals treated with adhesive, healing took place via formation of macroscopically solid scar tissue, although histological examination revealed abscess formation during the first 2 weeks and eventual fibrosis around the adhesive. There were no signs of pancreatitis, however, while in control animals septic complications and fistula formation were common. Sutureless closure of pancreatic wounds is concluded to be technically feasible, but possibly inadvisable clinically, with the presently available adhesives, because of the marked local inflammation.

3129 RESULTS OF STUDIES FOLLOWING EXPERIMENTAL TRANSPLANTATION OF THE PANCREAS. *(Ger.)* Largiader, F. (Cantonal Hosp., Zurich, Switzerland). *Munchen Med Wschr* 111(12):652-654, 1969.

In a compilation and summary of original work also published elsewhere, it is pointed out that acute pancreatitis was observed in only 2 of 76 dogs subjected to orthotopic homotransplantation of the pancreas following duodenopancreatectomy, indicating that manipulation and temporary ischemia are well tolerated by the pancreas. All animals received antibiotics (1 g chloramphenicol daily) and immunosuppressive therapy (azathioprine, 6-8 mg/kg/day initially, reduced to 3-4 mg/kg/day) during the postoperative period. The main cause of death was thrombosis. The endocrine function of the transplanted pancreas remained well preserved for several weeks, with hyperglycemia developing only after immunological rejection had set in or in connection with peritonitis and thrombosis. Signs of rejection (ulcerative duodenitis with perforation) were seen in only 3 of the 70 animals which died during the first 30 days, and the serum amylase was found to be of little help in the early detection of homograft rejection. The other 6 dogs died (32-49 days postoperatively) after varying periods of normal pancreatic function, and in these cases the serum amylase seemed to have a greater prognostic significance. It is mentioned that some studies have also been carried out with heterotopic iliac transplantation of the pancreas.

3130 PROTEIN CONTENT AND PANCREATIC ENZYME ACTIVITIES OF DUODENAL JUICE IN NORMAL CHILDREN AND IN CHILDREN WITH EXOCRINE PANCREATIC INSUFFICIENCY. *(E.)* Zoppi, G. (U. Pediat. Dept., Kinderspital Zurich, Switzerland), W. H. Hitzig, H. D. Shmerling, H. Pluss, B. Hadorn and A. Prader. *Helv Paediat Acta* 23(6):577-590, 1968.

Duodenal juices of 10 controls, of 5 children with mucoviscidosis and of 3 children with exocrine pancreatic insufficiency of unknown but noncystic fibrosis origin were analyzed before and after pancreozymin and secretin stimulation. Protein electrophoresis, immunoelectrophoresis, and two-dimensional immunodiffusion techniques were used along with biochemical analyses of enzymes in the raw juice and after elution of single protein bands from the electrophoretic strips. A good correlation between protein and enzyme contents was found in norma children but not in those with exocrine insufficiencies, in whor enzyme activity was virtually absent. Protein electrophoresis in the latter group demonstrated serum albumin and an uniden tified protein (peak 1), an unidentified PAS-positive constituen in peak 2, trypsin (peak 3), α-amylase (peak 4), and IgA (peak 5).

3131 CLINICAL CORRELATIONS WITH PANCREATIC FUNCTION TESTS. *(E.)* Hershfield, N. B (Winnipeg Gen. Hosp., Manitoba), J. F. Lind and J. A. Hildes. *Canad Med Ass J* 98(4):185-188, 1968.

Pancreatic function tests with measurement of gastric-juice volume, amylase and maximal bicarbonate concentrations were performed on 145 patients suspected of having pancreatic dysfunction. In 70 patients the tests were normal; adequate follow-up was possible in 48 of these patients and the results wer confirmed in the latter. The tests were a useful indicator of pancreatic disease in patients showing more than one abnormal result in the three tests. Patients with only one abnormal valu had little evidence of pancreatic disease, and it was concluded that one abnormal value is a poor criterion for detection of dysfunction. Bilirubin response to pancreozymin proved to be a valuable indicator of biliary disease. Serum enzyme response to stimulation was of no value in pancreatic disease diagnosis. Routine cytological examination was not successful in demonstrating tumor cells in patients in whom carcinoma of the pancreas or contiguous organs was subsequently proved.

3132 DISACCHARIDES AND CYSTIC FIBROSIS OF THE PANCREAS. *(E.)* Gibbons, I. S. E. (Hosp. Sick Child., London, England). *Arch Dis Childh* 44(233):63-68, 1969.

Seventeen convalescent patients with cystic fibrosis of the pancreas, ages 2 to 16, underwent stool and urine analyses after varying dietary levels of 3-O-methyl-D-glucose, sucrose and lactose. Jejunal biopsy in the one patient who showed both clinical and biochemical intolerance to disaccharides revealed villous atrophy and reduced disaccharidase activity. An increased dietary disaccharide content resulted in sugar in the stools of 4 children as opposed to 2 before the change. A mixed disaccharide load resulted in disacchariduria in only 3 of 9 patients. Six children had mono- and disaccharides in their stools after a sucrose load and 5 others had significant sucrosuria. Abnormal 3-O-methyl-D-glucose excretion was found in 2 of 14 children. Lactose loading in 2 children with previous small bowel resections for meconium ileus resulted in shortened transit times in both and disaccharides in the urine and stool in one.

33 **PANCREATIC EXOCRINE FUNCTION FOLLOWING MESOCAVAL SHUNTING.** *(E.)* Rudick, J.
ount Sinai Sch. Med., New York, N. Y.), M. J. Zerpa and
A. Dreiling. *Ann Surg* 169(1):67-73, 1969.

ven adult mongrel dogs (16-21 kg in body weight) had
omas cannulae placed in their duodenums following ligation
the accessory pancreatic duct, and then had gastric cannulae
ced to divert gastric acid secretions. Control secretory ob-
vations were made 4 weeks after operation and five animals
en had mesocaval shunting procedures while the others were
ojected to sham operations. Pancreatic stimulation was re-
ated 2 weeks later by i.v. secretin 1 U/kg, 5 U/kg and finally
a combination of secretin 1 U/kg and pancreozymin 1 U/kg
d the secretions collected from the major pancreatic duct.
tal volume, bicarbonate, chloride and amylase concentrations
re measured and all but the chloride concentration were
ninished after shunting. No microscopic or macroscopic
anges were noted in the livers at autopsy. Sham operations
d no effect on secretions.

34 **EXOCRINE PANCREATIC FUNCTION BEFORE AND AFTER BILLROTH II GASTRECTOMY.**
) Wagner, E. (Dept. Surg., U. Giessen, Germany). *German
d Monthly* 12(11):527-532, 1967.

triple-channel double balloon (Bartelheimer) was used to
llect the entire duodenal contents of healthy subjects and of
ients before gastrectomy. For postoperative studies a spe-
lly-designed tube was passed nasally into the stomach for the
llection of gastric juice. Patients with gastric stenosis and
ose with a bleeding ulcer were excluded. The exocrine func-
n of the pancreas was tested quantitatively after stimulation
th pancreozymin or secretin. The rates of enzyme secretion
er pancreozymin were virtually within the same range for
healthy subjects and 20 ulcer patients. Fourteen of the
er patients were studied again within 3-4 months after par-
l gastrectomy. The differences in rates of enzyme secretory
ume, and bicarbonate level were not statistically significant.
10 of the 14 ulcer patients studied, the rate of secretion of
rly all enzymes was greater after secretin than after pan-
ozymin stimulation. The rate of volume secreted was not
ninished pre- or 4-months-postoperatively. Four or more yr
stoperatively, 38 of 59 postgastrectomy patients showed a
sociated or complete failure of pancreatic enzyme produc-
n. In 16 patients the secretory volume, and in 26 the bicar-
nate concentration were below normal. These findings em-
asize the need for a short, retrocolic afferent loop and a
l gastroenterostomy (Polya-Reichel modification) in the
lroth II gastrectomy.

3135 **IMMEDIATE RESULTS OF THE WORLD'S FIRST TRANSPLANT OF THE PANCREAS WITH LIGATION OF THE PANCREATIC DUCTS.** *(Por.)* Teixeira, E. D. (Silvestre Hosp., Guanabara, Brazil), R. Faria, G. Monteiro, R. Bandeira, M. De Cenzo, T. Calicchio, J. Rodrigues and J. J. Bergan. *Hospital (Rio)* 75(1):147-151, 1969.

3136 **DIFFICULTIES IN THE DIAGNOSIS AND STAGING OF PANCREAS CANCER.** *(Pol.)* Dziwiński, S. (2nd. Clin. Int. Dis., Acad. Milit. Med., Warsaw, Poland), T. Grabowski and A. Żulawnik. *Wiad Lek* 21(21): 1981-1984, 1968.

3137 **SOME METABOLIC ASPECTS OF EXOCRINE PANCREATIC DISEASE.** *(E.)* Banks, P. A. (Mount Sinai Sch. Med., New York, N. Y.) and H. D. Janowitz. *Gastroenterology* 56(3):601-617, 1969.

3138 **THE CLINICAL ASPECTS AND SYMPTOMS OF DISEASES OF THE PANCREAS.** *(Ger.)* Forell, M. M. (2nd U. Med. Clin., Munich, Germany). *Röntgenblatter* 22(1):20-23, 1969.

3139 **THREE CASES IN CHILDREN OF PSEUDOCYST OF THE PANCREAS ANASTOMOSED WITH THE STOMACH.** *(Pol.)* Pron, A. (Munic. Pediat. Hosp., Sosnowiec, Poland). *Pol Tyg Lek* 24(9):324-325, 1969.

3140 **MECONIUM ILEUS SECONDARY TO PARTIAL APLASIA OF THE PANCREAS: REPORT OF A CASE.** *(E.)* Auburn, R. P. (U. Chicago Hosp., Ill.), S. A. Feldman, T. R. Gadacz and M. I. Rowe. *Surgery* 65(4):689-693, 1969.

3141 **CYSTIC FIBROSIS OF THE PANCREAS. [EDITORIAL]** *(E.)* Anonymous. *Brit J Clin Pract* 23(5):185, 1969.

3142 **PANCREATIC TRAUMA.** *(E.)* Foley, W. J. (U. Michigan Med. Ctr., Ann Arbor). *Postgrad Med* 45(6):106-109, 1969.

See also: 2758,2776,2782,2785,2795,2796,2839,2844,3236,3274

3143 A COMPARATIVE STUDY OF PANCREATOGRAPHY AND ENZYME SECRETION FOLLOWING DRAINAGE OF THE PANCREATIC DUCT.

(Sp.) Artigas, V. (S. Cruz S. Pablo Hosp., Barcelona, Spain), M. T. Ribera and J. Puig la Calle. *Rev Esp Enferm Apar Dig* 27(7): 1013-1018, 1968.

In 12 patients treated for pancreatic insufficiency due to chronic recurrent pancreatitis (of biliary, metabolic or alcoholic origin), 4 of whom had obstruction of the distal pancreatic duct, the results of pancreatography and studies of pancreatic amylase secretion (basal and stimulated with prostigmine) were followed before and after drainage of the pancreatic duct. The pancreatographic picture was normal 8-13 days postoperatively in 8 of the 9 cases in which it had been abnormal at surgery, while 1 patient still showed slight dilatation of the pancreatic duct at 7 days. Pancreatic amylase secretion increased rapidly after ductal drainage in all 4 cases of ductal obstruction and in some of the others, but remained below normal in all cases in which ductal obstruction was not the primary problem. The importance of taking ductal or parenchymal pathology into consideration in the treatment of pancreatic disease is emphasized, along with the inadequacy of pancreatic duct drainage in cases of pancreatic insufficiency not due primarily to ductal obstruction.

3144 THE PATHOGENESIS OF ACUTE HEMORRHAGIC NECROSIS OF THE PANCREAS.

(Ger.) Hoferichter, J. (Surg. Clin., U. Erlangen, Germany). *Munchen Med Wschr* 111(12):654-658, 1969.

Among 50 patients with acute necrosis of the pancreas (confirmed by biopsy), 14 had a definite history of pancreatic trauma (including 13 of 19 postoperative cases) and 7 had occlusion of the outflow ducts due to stones in the ampulla (4 cases) or common bile duct (3 cases). Only 8 of these patients survived. The fatal course of acute pancreatic necrosis is ascribed to the formation of extremely toxic globin hemochromes during the enzymatic breakdown of released blood. Such hemochromes can be demonstrated, thanks to their typical absorption curve, in patients in irreversible shock due to acute pancreatitis and in patients with strangulation ileus. The probable mechanisms of this complication are outlined in detail. Other etiological factors which may contribute to the development of acute pancreatic necrosis by creating the conditions under which hemoglobin breakdown can take place are an increase in intraabdominal pressure, stenosis of the ampulla due to stones, ascariasis or duodenal diverticula, and disorders of pancreatic enzyme secretion caused by increased pancreatic blood flow, alcoholism, hyperlipemia, hyperparathyroidism, or activation of the pancreatic enzymes.

3145 CLINICAL OBSERVATION OF PANCREATITIS CAUSED BY ANASTOMO-FUNCTIONAL ALTERATIONS OF DUODENUM AND ITS SPHINCTERIC APPARATUS.

(It.) Gemma, G. B. (Inst. Clin. Gen. Surg. U. Genoa, Italy), E. Berti-Riboli and A. Gramegna. *Gaz Med Chir* 73(22):1966-1980, 1968.

Regressed experiments on animals showed that a severe endoduodenal hypertension for a long period or with insufficiency of Oddi's sphincteral mechanism can cause pancreatopathy. The experimental demonstration was confirmed in 3 clinical cases: 1 partial duodenal occlusion (with intraluminal hypertension); 1 partial duodenal stenosis associated with sphincterotomy; 1 sphincterotomy. While in the 1st patient, with a normal sphincteral defense, there was a slight histologic alteration of the pancreas of doubtful meaning, in the 2nd and 3rd cases evident anatomical-pathologic alterations were present: connectival infiltration of the gland, periductal sclerosis, cytoplasmic vacuolization and nuclear pyknosis.

3146 EXPERIMENTAL PANCREATITIS: TREATMENT BY COLLOID REPLACEMENT AND ADRENOCORTICOSTEROID THERAPY COMBINED WITH THORACIC DUCT DRAINAGE.

(E.) Schiller, W. R. (Northwestern Med. Sch., Chicago, Ill.), A. Duprez, W. B. Iams, M. Suwa and M. C. Anderson. *Arch Surg (Chicago)* 98(6):698-702, 1969.

After obtaining a control volume of lymph flow from cannulated thoracic ducts of healthy adult mongrel dogs, pancreatitis was produced by infusing 10 to 15 ml of fresh lyophilized trypsin into the pancreatic ducts and ligating the superior pancreatic vein. Lymph samples were obtained every 30 min for 6-8 hr during which time 5 dogs received no treatment, 22 dogs were treated with commercial dextran (25 ml/kg) plus lymph replacement, 13 received dextran 40, and 12 animals were given 100 mg hydrocortisone i.v. and 100 mg cortisone acetate i.m. along with dextran 40 at the start of the procedure. All the dogs in the first three groups died. The greatest amount of abdominal fluid was present when dextran 40 was given. A combination of adrenocorticosteroids and dextran 40 resulted in augmented lymph flow, less abdominal fluid and increased survival.

3147 ASSESSMENT OF METHEMALBUMIN AS A DIAGNOSTIC TEST FOR ACUTE PANCREATITIS.

(E.) Anderson, M. C. (Northwestern U. Med. Sch., Chicago, Ill.), I. R. Toronto, S. B. Needleman and L. Gramatica. *Arch Surg (Chicago)* 98(6):776-780, 1969.

Following ligation of the accessory duct of the pancreas, the major duct was cannulated in 19 healthy mongrel dogs (10-19 kg). It was infused with: buffer diluent (1 animal), with 10-15 ml of trypsin which contained 8000-10,000 U tryptic activity/ml (5), a similar dose of trypsin which was allowed to undergo autoincubation (2), carbowax (2), 100 mg fresh lipase (2), a 10 ml mixture of lipase (10 mg/ml) and whole blood (1), and 15 ml of trypsin followed by ligation of the superior pancreatic vein (6). In 7 other animals a segment of jejunum was strangulated and in 3 others the superior mesenteric artery was occluded. Eight of 11 dogs developed hemorrhagic pancreatitis after infusion; 6 of 7 dogs subjected to strangulation and the 3 with acute occlusion demonstrated methemalbumin in their peripheral venous blood.

3148 CHANGES IN THE SERUM ELECTROLYTE LEVELS DURING ACUTE PANCREATITIS.

(Rus.) Liul'ko, A. V. (Dnepropetrovsk Med. Inst., USSR), V. F. Pekarskii and N. D. Loskutova-Chukhriienko. *Klin Med (Moskva)* 47(4):68-71, 1969.

Flame photometry revealed a moderate increase in serum K and decrease in serum Na during the first 3 days of acute pancreatitis in about 60% of 75 patients (22 men and 53 women, 24-76 yr old). Thus, compared to control values of 4.1-5.6 and 130-152.2 mEq/liter, resp., 47 patients had K levels of 6.7-11.5 mEq/liter, 26 patients had normal K levels, 2 had hypokalemia of 3.1-3.6 mEq/liter, 44 had Na levels of 100.4-125.2 mEq/liter, and 31 had normal Na levels. After clinical recovery, the serum Na and K levels were normal in 38 of 52 patients. A similar increase in serum K was observed in 30 dogs in which acute pancreatitis was produced experimentally by ligation of the pancreatic duct, with or without instillation of bile and duodenal contents. In dogs, however, hypokalemia was noted only just before death. These shifts in serum electrolyte levels should be taken into consideration in the treatment of acute pancreatitis.

3149 A CASE OF ACUTE HEMORRHAGIC PANCREATIC NECROSIS IN A FETUS. *(It.)* Baruzzi, G. (Inst. Anat. and Hist. Pathol., U. Bologna, Italy). *Arch Ital Anat Istol Pat* 42(4):313-327, 1968.

A rare case is reported of a fetus affected by acute hemorrhagic pancreatitis and born dead. The mother had a toxicosis with hyperazotemia, albuminuria and fever during the 4th-5th month of pregnancy, but recovered after therapy. The autopsy of the fetus showed generalized acute stasis with hemorrhage of serosa and hemoperitoneum; massive hemorrhage of the pancreas and the adrenals, mainly the left one; presence of Botallo's foramen and duct (diameter 3 mm); fetal atelectasia of the lungs. The histologic diagnosis was: in the pancreas acute hemorrhagic pancreatitis and necrosis; in the liver severe hepatocellular degeneration with acute stasis and erythroblastosis; and in the spleen acute stasis, atrophy of the lymphatic tissue and erythroblastosis.

3150 CHRONIC PANCREATITIS: ITS PATHOGENESIS, DIAGNOSIS AND SURGICAL TREATMENT. *(It.)* Roecker, F. *Riforma Med* 83(2):54-58, 1968.

3151 PANCREATIC ASCITES. [CASE REPORT] *(E.)* Lazaro, E. J. (New Jersey Coll. Med. and Dent., Newark), P. B. Das and P. V. Abraham. *Amer J Gastroent* 51(4):287-292, 1969.

3152 CHRONIC CALCAREOUS PANCREATITIS AND CHOLEDOCHAL STENOSIS ABOVE THE PANCREAS. *(It.)* Accarpio, G. (Inst. Spec. Surg. Path., U. Genoa, Italy), U. Valente and P. Alitta. *Rass Arch Chir* 6(6):351-359, 1968.

3153 ANGIOGRAPHY IN ACUTE PANCREATITIS. *(E.)* Aakhus, T. (Ullevål Hosp., Oslo, Norway), M. Hofsli and E. Vestad. *Acta Radiol* 8(2):119-128, 1969.

See also: 2691,2692

LIVER AND BILIARY TRACT
GENERAL

3154 ACUTE INTERMITTENT PORPHYRIA AND ITS BIOCHEMICAL PATHOGENESIS. *(Ger.)* Heilmeyer, L. (Inst. Med. Sci., Ulm, Germany). *Munchen Med Wschr* 111(16):905-909, 1969.

Studies of urinary heme-precursor excretion in 2 patients with acute intermittent porphyria and 2 with Günther's congenital porphyria showed that in the former, the urine contained 20-200 times as much δ-aminolevulinic acid and porphobilinogen as porphyrins. In congenital porphyria, on the other hand, more porphyrins are excreted in the urine. It was also shown that prophyrins can be formed spontaneously from porphobilinogen in the urine and that most of the porphyrin formed is of isomeric type I, the type which predominates in the urine of patients with porphyria. Finally, biochemical studies with a liver homogenate prepared from a patient with acute intermittent porphyria showed considerably less formation of uroporphyrin than in normal liver homogenates. It is concluded that acute intermittent porphyria is due to a defect in porphobilinogen deaminase combined with a simultaneous increase in precursor formation.

3155 THE AVOIDANCE OF PRIMARY HYPOXIC ORGAN DAMAGE DURING LIVER TRANSPLANTATION BY SUITABLE PERFUSION WITH NON-HEMOGLOBIN-CONTAINING PERFUSION FLUIDS. *(Ger.)* Zimmermann, W. E., M. Kessler, D. W. Lübbers, D. Seitz and R. Dierkesmann. *Langenbeck Arch Klin Chir* 322(Kongressber.): 1145-1151, 1968.

A perfusion technique is described which makes it possible to extend the perfusion period of pig livers with hemoglobin-free solutions up to 8 hr while guaranteeing a tissue pO_2 of 50-540 mm Hg, which eliminates the danger of hypoxic damage. The principal feature of the technique is that perfusion is begun while the liver is still *in situ,* via the hepatic artery (pressures of 160/80 mm Hg and a flow of 180/230 cc/min) and portal vein (pressure of 20-30 cm H_2O and flow of 800-900 cc/min), combined with hypothermia to 18-20C. The liver is then transferred to a specially designed perfusion chamber and a medium is used which contains 5% albumin or isooncotic dextran to prevent edema, bicarbonate or Tris-buffer to keep the pH above 7.25, coenzyme A, glucose, reduced nicotinamide adenine dinucleotide, pyruvate and sodium capronate. Experiments with pig livers in which the tissue pO_2, pO_2 of the perfusion fluid, and the loss of hepatocellular enzymes were monitored showed that only the first parameter is sufficiently sensitive to detect incipient hepatic hypoxia. Hypothermia had to be achieved within 15-20 min after removal of red blood cells from the perfusing medium in order to avoid irreversible liver damage.

3156 SECONDARY HEPATIC LESIONS COMPLICATING CHOLELITHIASIS. *(Sp.)* Aznar Reig, A. (Fac. Med., Sevilla, Spain), E. Zamora Madarias, F. Bonilla Mir, J. Lopez Campos and R. Majua Delgado. *Rev Esp Enferm Apar Dig* 27(7):1019-1040, 1968.

Liver biopsies and a battery of liver function tests (galactose and sodium benzoate loading, flocculation tests for the plasma proteins, and ^{131}I-Rose Bengal and colloidal ^{198}Au clearance) were performed in 20 patients (30-61 yr old) with radiologically and surgically confirmed gallbladder lithiasis who presented with a long history (4-180 months) of acute paroxystic pain sometimes associated with jaundice or subicterus. The plasma proteins were abnormal in 60-77% and the hippuric acid and galactose excretion were abnormal in 15-35%, but there was no parallel between these 4 tests, which are concluded to be of little use in the diagnosis of these syndromes. The isotope studies, on the other hand, were highly sensitive (abnormal values in all cases) and revealed 3 distinct subgroups: generalized nonspecific secondary hepatitis in 30%, mesenchymal nonspecific secondary hepatitis (not affecting the parenchyma) in 38%, and hepatitis involving only the intrahepatic portal or reticuloendothelial system in 30%. There was also no parallel between disturbances in liver function and the histological findings, which were minimal except for consistent anisokaryocytosis and lymphoplasmocytic infiltration of the Kiernan's spaces. The hepatic involvement, which is ascribed to biliary sepsis and the indirect effects of bacterial toxins, had no apparent effect on the course of the cholelithiasis and was unrelated to the duration of illness.

3157 THE OUTCOME FOR THE JAUNDICED PATIENT. *(E.)* Honner, R. (Royal Prince Alfred Hosp., Sydney, Australia). *Med J Aust* 1(20):836-838, 1968.

All 94 jaundiced patients hospitalized during a 1-yr period were reviewed and found to include 43 men and 51 women whose ages were mostly between 50 and 80. There were 56 cases of obstructive jaundice and 38 cases of nonobstructive jaundice among the 94 whose diagnoses included nonmalignant biliary disease (32), infectious hepatitis (15), carcinoma of the pancreas (13), liver damage due to drugs, alcohol, or miscellaneous diseases (14), unknown etiologies (9), primary malignant disease (7), and metastatic involvement of the liver (4). Twenty percent of both the obstructive and nonobstructive jaundice groups died in the hospital. Of the 32 cases of nonmalignant disease, 26 were treated surgically, of which 1 was acute cholecystitis; the remaining 6 cases (all acute cholecystitis) were treated conservatively. Four cases of primary gallbladder malignancy were observed; 2 of them presented as cholelithiasis and jaundice.

3158 PROLONGED OBSTRUCTIVE JAUNDICE IN BANTU INFANTS. *(E.)* Pretorius, P. J. (U. Pretoria, South Africa), I. W. Simpson, C. R. Jansen, J. G. Prinsloo, L. S. de Villiers and C. van Heerdon. *S Afr Med J* 42(21):518-527, 1968.

Twenty Bantu infants, all of whom were under 5 months of age, but one (1 yr old), were investigated because of clinical jaundice and elevated serum bilirubin. Serological tests for syphilis, and toxoplasmosis, blood counts and cultures, urine cytologies for cytomegalic inclusion disease, tests for urinary reducing substances and ^{131}I Rose Bengal tests were obtained in addition to total serum proteins, thymol turbidity and flocculation, alkaline phosphatase, total and conjugated serum bilirubin, SGOT, SGPT, and LDH. Liver biopsies were performed in 9 patients, wedge biopsies in 3, and in 2 the liver was examined at autopsy. The causes of jaundice and serum bilirubin elevation included neonatal hepatitis (5), syphilitic hepatitis (5), extrahepatic biliary atresia (3), cirrhosis of unknown etiology (2), veno-occlusive disease (2), sepsis (1), and etiology unknown (2). The ^{131}I Rose Bengal test proved useful in distinguishing between biliary atresia and neonatal hepatitis. Liver biopsy may often reveal the cause of obstructive jaundice, and together with the ^{131}I test, should establish the etiology in most cases.

3159 **HEPATIC ARTERY LIGATION.** *(E.)* Prakash, A. (All-India Inst. Med. Sci., New Delhi) and M. C. Tanga. *Int Surg* 50(1):167-174, 1968.

In 27 adult albino rats (100-375 g body weight) the hepatic artery was ligated beyond the origin of the right gastric and gastroduodenal vessels, and in 19 others a sham operation was performed. The animals were sacrificed at intervals of 2 hr; 1, 2, 3 and 5 days; and 2, 4, 6, 8, and 12 weeks. Gross and microscopic examination of the hepatic tissues were made and failed to reveal any significant changes in 18 of the control animals. One of the controls died of biliary obstruction due to an adhesion. The gross changes of congestion and ischemia, and the microscopic changes of necrosis, infection, and glycogen (and fatty) infiltration were spotty and inconstant in the animals with the ligations. Three animals in the ligation group died within 24 hr of surgery. No scarring or cirrhosis was seen in any of the animals. The contribution of the hepatic artery to circulation appears negligible.

3160 **SPONTANEOUS RUPTURE OF THE LIVER IN PREGNANCY.** *(E.)* Notelovitz, M. (King Edward VIII Hosp., Durban, South Africa) and D. Crichton. *S Afr Med J* 42(19):476-480, 1968.

The etiology, precipitating factors and pathology of spontaneous rupture of the liver in 4 cases during pregnancy is presented together with a review of the literature. Attention is drawn to the pathognomonic triad of symptoms: eclampsia, sudden right-sided hypochondrial or epigastric pain, and subsequent vascular collapse. Successful treatment is dependent on very rapid institution of adequate blood replacement of massive hemorrhage and immediate hemostasis. The importance of team-work is self-evident, as is early laparotomy with adequate exposure. Best exposure is achieved through a transverse upper abdominal incision. If a diagnosis of hemorrhage emanating from the upper abdominal viscera can be surmised through a lower abdominal incision, there is no purpose in further extension of the vertical incision. Immediate temporary–followed by effective permanent–hemostasis is imperative. When hemostasis cannot be achieved by the usual measures, ligation of the hepatic artery should be considered. Gentle handling of the liver is advocated because further stripping of the capsule, and rupture of the further-exposed subcapsular hemotomata, may seriously aggravate the condition and render a previously manageable procedure inoperable.

3161 **VENESECTION THERAPY IN IDIOPATHIC HAEMOCHROMATOSIS: AN ANALYSIS OF 40 TREATED AND 18 UNTREATED PATIENTS.** *(E.)* Williams, R. (King's Coll. Hosp., London, England), P. M. Smith, E. J. F. Spicer, M. Barry and S. Sherlock. *Quart J Med* 38(149): 1-16, 1969.

Forty patients with idiopathic hemochromatosis treated by venesection were compared with 18 untreated individuals, most of whom had died before venesection therapy became accepted. The 5-yr mortality rate was 11% in the treated group as opposed to 67% of those untreated. Mean survival times averaged 8.2 and 4.9 yr, resp. A hepatoma was the cause of the death in 4 of the treated patients. Weekly bleedings removed a mean total of 12 g of iron and diminished pigmentation and hepatosplenomegaly while improving the results of liver function studies. There was less improvement demonstrable by liver biopsy. Eight of 26 patients with diabetes in the treated group showed improvement in carbohydrate tolerance and 3 were able to discontinue insulin. No improvement was noted in the untreated group.

3162 **SIMPLIFIED TECHNIC FOR HUMAN AUXILIARY LIVER TRANSPLANTATION.** *(E.)* Sheil, A. G. R. (Royal Prince Alfred Hosp., Sydney, Australia), J. Rogers, J. May, B. Storey, J. Kuruvila, C. George, F. R. Berry and J. H. Stewart. *Amer J Surg* 117(3):359-362, 1969.

A simplified technique for auxiliary transplantation of the liver, developed in cadavers and successfully used in dogs, was applied to a 45-yr-old man with rapidly worsening cirrhosis. The patient died 4 days postoperatively due to prolonged hypotension. In this technique, the allograft is placed in the right paracolic gutter with the right lobe inferior and the hilum medial. The superior aspect of the allograft vena cava is anastomosed to the recipient infrarenal vena cava. The donor celiac axis is anastomosed to the front of the recipient aorta and the portal vein to the recipient superior mesenteric vein. Biliary drainage is by Roux-en-Y anastomosis of the jejunum to the gallbladder. Autopsy revealed anoxic damage to the liver and kidney and hemorrhage into the pituitary.

3163 **IMPROVED TECHNIQUE FOR HUMAN HEPATIC RESECTION.** *(E.)* Gentile, J. M. (Royal Victoria Hosp., McGill U., Montreal, Quebec, Canada) and L. D. MacLean. *Amer J Surg* 117(3):424-425, 1969.

A new technique is described which was designed to eliminate the dangers of avulsion of the hepatic vein from the inferior vena cava or ligation of a vein draining a part of the liver which is not to be resected. An umbilical tape is placed around the intrapericardial part of the inferior vena cava. Intermittent occlusion by traction on the tape produces engorgement of the intrahepatic veins and improves their identification. Each large vessel can then be ligated and transected individually.

3164 **EXPERIENCE WITH HEPATIC RESECTION IN CHILDHOOD.** *(E.)* Taylor, P. H. (Harvard Med. Sch., Boston, Mass.), R. M. Filler, R. A. Nebesar and M. Tefft. *Amer J Surg* 117(4):435-441, 1969.

Twenty-two children underwent partial hepatectomy for primary malignancy (9), lymphangiomas (4), metastatic Wilm's tumor (3), simple cyst (2), trauma (1), hamartoma (2) and adenoma (1) during a 15-yr period. Only 1 was older than 8 yr and 14 were under 2. There were 3 intraoperative hemorrhage deaths, 1 air embolus death at surgery and 2 children died of tumor metastases. Three operative deaths were in children under 1 yr of age. Preoperative radioisotope scans, and hepatic and superior mesenteric arteriograms were helpful in delineating liver masses and hepatic artery anomalies. Postoperative scans were useful in evaluating liver regeneration and timing of chemotherapy. Blood loss and replacement were critical and central venous pressure monitoring was used. Long term survivors reveal no evidence of growth and development impairment.

3165 **HEPATIC INJURY IN CHRONIC INDUSTRIAL SATURNISM.** *(Fr.)* Banciu, T. (Inst. Med. Timisoara, Romania), L. Georgescu, Z. Sirbu, M. Banciu, C. Lesnic and T. Koos. *Rev Intern Hepat* 17(7):635-650, 1967.

Of 350 patients studied, 255 had chronic lead poisoning and 95 had an elevated absorption of lead. Males represented 86% and females 14% of the patients studied. The majority of the patients with lead poisoning (52.7%) had been employed in the industrial machining of lead and 25% of them had histories of acute lead intoxication. Of the 350 cases, 14.9% were found to have liver pathology histologically confirmed. Patients with other causes of hepatic injury were excluded from this study. The liver lesions observed were believed specific for lead poisoning: hepatocellular injury with increases in SGOT and SGPT in 86%, and a combined γ-, β- and α-euglobins pattern. There was histological evidence of hepatic epithelial degeneration with intracellular pigment, and minimal inflammatory reaction. Lead apparently attacks the oxidative mitochondrial systems directly, and indirectly induces an intrahepatic circulatory disturbance. Diagnosis is difficult: liver puncture is necessary for differential and positive diagnosis.

3166 **SERUM GUANASE IN DIAGNOSIS OF LIVER DISEASE.** *(E.)* Coodley, E. L. (Hahnemann Med. Coll., Philadelphia, Pa.). *Amer J Gastroent* 50(1):55-62, 1968.

Spectrophotometric measurements of serum guanase levels were made along with SGOT, SGPT, alkaline phosphatase and protein determinations in 75 (49 males, 26 females) patients with suspected liver disease and/or jaundice. Guanase activity was elevated in 48 of 54 patients with proven hepatitis. Sera were drawn from the other 6 more than 10 days after the onset of jaundice. A small increase of guanase was noted in 10 of 21 patients with other diseases, but this exceeded 5 U in only 5. SGOT and SGPT gave comparable results and provided the diagnosis in 2 cases where guanase was normal. In 5 patients, however, guanase provided the diagnosis of hepatitis when the other enzymes were normal.

3167 **STUDIES ON THE RESULTS OF TEMPORARY HEPATIC ASSISTANCE IN THE DOG. III. HISTOLOGICAL AND ULTRASTRUCTURAL FINDINGS IN THE TRANSPLANTED LIVER.** *(Fr.)* Chrzanowska, M. (Ed. Herriot Hosp., Lyon, France), J. Feroldi and Y. Mallet-Guy. *Lyon Chir* 65(1):20-35, 1969.

Histological and (in 8 cases) electron microscopic studies of the transplanted liver were carried out in 42 dogs between 15 min and 8 hr after heterotopic implantation of a donor liver maintained by extracorporeal circulation. The recipient's own liver was also studied by biopsy 5-6 hr after the operation. In most animals, regardless of the surgical procedure, perfusion technique and variations in hepatic blood flow (0.25-1.25 cc/g/min), histological deterioration of the transplant was noted after about 3 hr, characterized by alterations in the hepatic sinusoids, hyperplasia of the Kupffer cells, and areas of hemorrhagic necrosis. Biopsy specimens of the recipients' livers were normal in only one of 16 cases, the others also showing sinusoidal changes, accumulation of cellular debris and congestion progressing to necrosis. The first ultrastructural changes in the donor livers (decreased glycogen, cytoplasmic damage, lesions in the endothelium and the walls of the sinusoids) were seen even earlier, however, between 1 and 2 hr after transplantation. These lesions resembled those seen after arterialization of the portal vein. It is concluded that perfusion of a donor liver through the portal circulation only may be preferable to the use of both circulations, and that a relatively low blood flow is better tolerated.

3168 **SOME OBSERVATIONS ON THE FINE STRUCTURE OF THE HUMAN LIVER IN CONGENITAL BILIARY ATRESIA.** *(Jap.)* Abe, R. (Fac. Med., Kyushu U., Fukuoka, Japan). *Arch Histol Jap* 28(5): 503-524, 1967.

Electron microscopy studies were performed on the livers of 20 patients (2-6 months old) with congenital biliary atresia and on 7 control babies. Embryonic livers from 15 human fetuses were also examined. In congenital biliary atresia a characteristic feature of the liver cells is anomalous microvillous cell borders which line the elongated perisinusoidal and extensively developed intercellular space. Other striking features are displacement of the nucleus and the rugged shape of the hepatocyte. The normal embryonic liver shows, even in the 6-week fetus, hepatocytes arranged to contact each other with the usual width of intercellular space seen in the adult liver. A single teratogenic factor may cause both the malformation of the bile duct and the surface change of the hepatocyte.

3169 **ENZYME AND FUNCTION CHANGES AFTER EXTENSIVE LIVER RESECTION IN MAN.** *(E.)* Almersjö, O. (U. Göteborg, Gothenburg, Sweden), S. Bengmark, L. O. Hafström, and R. Olsson. *Ann Surg* 169(1): 111-119, 1969.

Liver function studies, including SGOT, SGPT, alkaline phosphatase, bilirubin and BSP retention, were performed preoperatively and up to 4 weeks after hepatic resection in 12 patients. SGOT and SGPT elevations varied considerably postoperatively and bore no relation to the extent of resection but were inversely correlated with the duration of surgery. Serum alkaline phosphatase was minimally affected by operation, a marked elevation being observed only when there were marked elevations preoperatively. Serum bilirubin concentration and BSP retention were directly related to the extent of resection.

3170 **CLINICAL AND LABORATORY FINDINGS IN PATIENTS WITH HEPATOMA: A PRELIMINARY REPORT.** *(E.)* Font, R. G. (Tulane U. Sch. Med., New Orleans, La.) and R. D. Sparks. *J Louisiana Med Soc* 120(4):178-186, 1968.

Of 610 autopsies performed over a 2 yr period, 8 revealed primary hepatic parenchymal cell carcinomas. All were male and the average age was 58. Three patients had a history of alcoholism and 1 of chronic hepatitis. Abdominal pain was the presenting symptom in 6, jaundice in 1, and abdominal swelling in 1. Nodular hepatomegaly was noted in all, splenomegaly in 2, hepatic bruit in 2, and ascites in 5. Laboratory data included the following: moderate leukocyte elevations and increased BSP retention in all; and serum alkaline phosphatase and SGOT elevations in 7. Histologic sections at atuopsy revealed postnecrotic cirrhosis (2), posthepatic cirrhosis (5) and no cirrhosis (1). Three abnormal liver scans were noted. Survival time after the onset of symptoms was 3 months.

3171 **LIVER FUNCTION TESTS IN CANCER OF THE LIVER. PRIMARY AND METASTATIC STUDY OF 54 CASES.** *(E.)* Horiuchi, N. (Ctr. Adult Dis., Osaka, Japan), T. Kitamura, F. Nakagawa and K. Omori. *Ann Rpt Center Adult Dis* 7(1):8-18, 1967.

Liver function tests were performed on 54 patients (23 with primary hepatic cancer 9 of whom also had liver cirrhosis; 31 with metastatic tumor 5 of whom had liver cirrhosis. Enlargement of the liver was seen in all patients with primary liver cancer, while in 5 of 31 patients with metastatic carcinoma it was not palpable. The serum bilirubin index was below 9 in 14 patients with primary cancer (61%) and in 18 patients with secondary cancer (17%) and 5 cases of metastatic cancer (16%). The zinc sulfate, thymol turbidity and cephalin cholesterol flocculation tests showed abnormal values for cirrhosis of the liver with or without primary cancer. These tests seem to have no specific diagnostic value for hepatic carcinoma. The Ro cobalt reaction was observed in a higher percentage of patients with, than in those without, liver cancer. The BSP test was sensitive, but nonspecific: 72% of the patients (regardless of primary or secondary) showed impaired BSP (above 11%) clearance. Normal BSP retention (values below 5% in 45 min) occurred in only 2 of 54 patients. Alkaline phosphatase activity was relatively specific and sensitive for diagnosis: 90% of the patients with hepatic cancer showed an increase (more than 4 Bodansky U). Patients with chronic hepatitis or liver cirrhosis had a low concentration of alkaline phosphatase (less than 3.9 Bodansky U). The mean values were 10.3 Bodansky U in the primary cancer group and 11.7 Bodansky U in the metastatic cancer group. Leucine aminopeptidase (LAP) activity was normal in only 17% of the patients with hepatic cancer, but normal in 72% of the patients with chronic hepatitis or liver cirrhosis. A number of patients with hepatic cancer showed elevated SGOT and SGPT activities; however, extremely high levels were unusual. The SGOT/SGPT ratio was more than 1 for a majority of the cases of liver cancer and cirrhosis; whereas it was less than 1 for a majority of chronic hepatitis cases.

3172 **HEPATIC STORAGE AND MAXIMAL BILIARY TRANSPORT OF SULFOBROMOPHTHALEIN IN PATIENTS WITH PORTAL HYPERTENSION.** *(E.)* Maddrey, W. C. (Inst. Postgrad. Med. Ed. Res., Calcutta, India), J. Thomas, A. K. Basu and F. L. Iber. *Johns Hopkins Med J* 124(3):157-162, 1969.

The hepatic storage and maximal excretory rate for BSP were determined in 46 patients with portal hypertension from postnecrotic cirrhosis (24), extrahepatic portal venous obstruction (16), or idiopathic portal fibrosis (6) and compared with a group of 14 normal control subjects. Significant lowering of both hepatic cellular storage and maximal biliary excretion was observed in patients with postnecrotic cirrhosis and in patients with extrahepatic portal venous obstruction. Histological alteration of hepatic cells was not necessary for functional changes to be observed. A feature common to the disorders with functional changes ia a reduced portal venous blood supply. The prolonged BSP infusion method of Wheeler was used with 3 infusion periods of 50 min with the 2nd and 3rd infusates 1/3 and 2/3, resp., of the concentration of the first period (0.3-0.4 mg BSP/kg body weight/min).

3173 **ANGIOMA OF THE LIVER IN THE NEWBORN.** *(Pol.)* Stoba, C. (Clin. Pediat. Surg., Gdansk, Poland) and M. Cimaszewski. *Wiad Lek* 21(22):2039-2042, 1968.

3174 **TYPES OF LIVER SUTURES.** *(Rus.)* Paipal, A. K. *Vestn Khir Grekov* 102(1):145, 1969.

3175 **A GIANT HEPATIC CYST IN AN INFANT.** *(Pol.)* Bittner, K. (2nd Pediat. Clin., Poznan, Poland), Z. Bartkowiak, J. Stryczyński and K. Wojciechowski. *Wiad Lek* 21(20):1851-1854, 1968.

3176 **HEPATIC AND PULMONARY POROCEPHALIASIS IN A MALAYSIAN ORANG ASLI (ABORIGINE).** *(E.)* Prathap, K. (Dept. Path., U. Malaya, Malaysia), C. P. Ramachandran and N. Haug. *Med J Malaya* 23(2):92-95, 1968.

3177 **PROLONGED JAUNDICE OF PREGNANCY. (A CASE REPORT).** *(E.)* Subramaniam, R. (Govt. Gen. Hosp., Madras, India), N. Madanagopalan and M. Chinnaswami. *Antiseptic* 66(2):129-132, 1969.

3178 **ASPECTS OF LIVER DISEASES IN CHILDREN.** *(Ger.)* Rossi, E. (Pediat. Clin., U. Bern, Switzerland) and H. Pfeiffer. *Praxis* 57(48):1700-1707, 1968.

3179 **AMEBIC LIVER ABSCESSES IN PREGNANT WOMEN. TWO CASES SIMULATING PULMONARY EMBOLISM.** *(Fr.)* Herreman, G. (Boucicaut Hosp., Paris, France), J. Himbert, J. Lissac, J. Reynier, J. Langlois, F. Nicolas and R. Benaim. *Bull Soc Med Hop Paris* 119(11): 907-913, 1968.

3180 **HYDATIC CYSTS OF THE LIVER. TOTAL CYSTECTOMY WITH DELAMINATION IN OPEN AND CLOSED CYSTS.** *(Fr.)* Geagea, E. (Beirut, Lebanon) and S. Chakar. *Bull Soc Int Chir* 27(3):223-228, 1968.

3181 **JAUNDICE: SYMPOSIUM AT THE 20TH CONGRESS OF GASTROENTEROLOGY IN BRAZIL.** *(Por.)* Vasconcellos, D., N. De Almeida Jr., G. Silveira, R. Daher, F. Alvariz and J. Salvador. *Rev Esp Enferm Apar Dig* 28(1):97-142, 1969.

3182 **CELLULAR IMMUNE RESPONSE DURING REJECTION OF A LIVER TRANSPLANT IN MAN.** *(E.)* Eddleston, A. L. W. F. (King's Coll. Hosp., London, England), R. Williams and R. Y. Calne. *Nature* 222(5194): 685-687, 1969.

3183 **HEPATO-LENTICULAR DEGENERATION. REPORT OF A CASE.** *(E.)* Singh, M. (All-India Inst. Med. Sci., New Delhi, India). *Indian J Pediat* 36(253): 44-47, 1969.

3184 **PHOTOTHERAPY AND HYPERBILIRUBINEMIA.** *(E.)* Behrman, R. E. *J Pediat* 74(6):989-990, 1969.

3185 **ULTRASTRUCTURAL ASPECTS OF THE LIVER IN SECONDARY HEPATIC AMYLOIDOSIS COMPLICATING PLASMACYTOMA.** *(It.)* Bacci, G. (Inst. Gen. Med. Clin., U. Bologna, Italy), R. Di Feliciantonio, F. B. Bianchi and S. Ferri. *Fegato* 14(4):451-460, 1968.

3186 **CLINICAL AND MORPHOLOGICAL STUDY OF THE LIVER IN THE COURSE OF CHRONIC RESPIRATORY INSUFFICIENCY.** *(It.)* Conti, F. (Inst. Pharmacol., U. Milan, Italy), G. Pelosi, M. Martini and O. Greco. *Fegato* 14(4):477-492, 1968.

3187 **THE LIVER AND DIABETES.** *(It.)* Tagliaferro, E. (Maggiore Hosp., Trieste, Italy), F. Franca, A. Campos and U. Pietron. *Minerva Med Giuliana* 8(4):323-326, 1968.

3188 **BENIGN OBSTRUCTIVE JAUNDICE.** *(Sp.)* Puente Pereda, F. (Natl. Fac. Med., Natl. Autonomous U. Mexico, University City). *Cir Cir* 36(5):451-455, 1968.

3189 **OBSTRUCTIVE JAUNDICE NOT DUE TO TUMORS: CLINICAL AND LABORATORY ASPECTS.** *(Sp.)* Ocaranza, M., J. *Cir Cir* 36(5):456-462, 1968.

3190 **BENIGN OBSTRUCTIVE HEPATIC JAUNDICE: PATHOANATOMICAL ASPECTS.** *(Sp.)* Gonzalez Angulo, A. (Div. Path., Dept. Sci. Invest., C. M. N., I. M. S. S., Mexico City). *Cir Cir* 36(5):441-450, 1968.

3191 **LIVER FUNCTION IN ARTIFICIALLY INDUCED TERMINAL STATES.** *(It.)* Shapiro, V. M. (Lab. Exp. Physiol., Acad. Med. Sci., Moscow, USSR). *Epatologia* 14(2):103-113, 1968.

3192 **STATISTICAL STUDIES ON THE PATHOGENESIS OF FATTY LIVER. II. PATHOGENETIC FACTORS IN HEPATIC STEATOSIS.** *(Ger.)* Hanefeld, M. (Carl Gustav Carus Med. Acad., Dresden, Germany H. J. Naumann and F. Renger. *Deutsch Gesundh* 23(52): 2467-2470, 1968.

3193 **MASSIVE LIVER HEMORRHAGE IN PATIENTS WITH TOXEMIA OF PREGNANCY.** *(Sp.)* Perez Rojas, E. (San Camilo Hosp., San Felipe, Chile) and E. Villablanca. *Rev Med Valparaiso* 21(3):86-88, 1968.

3194 **CHRONIC IDIOPATHIC NONHEMOLYTIC JAUNDICE SYNDROMES. NOTE I. CLINICAL, FUNCTIONAL AND ULTRASTRUCTURAL FINDINGS IN A CASE OF DUBIN-JOHNSON DISEASE.** *(It.)* Naccarato, R. (Inst. Spec. Med. Path., U. Padua, Italy), L. Okolicsanyi, G. Previato, U. Fagiolo, A. Rizzo and P. F. Gambari. *G Clin Med* 49(11):1053-1067, 1968.

3195 **JAUNDICE IN ELDERLY SUBJECTS.** *(Fr.)* Vignalou, J. and H. Beck. *Rev Franc Geront* 14(5):257-262, 1968.

3196 **RARE ANOMALIES OF THE PORTAL CIRCULATION.** *(Ger.)* Breining, H. (Inst. Path. Anat., U. Erlangen, Germany) and A. Schuch. *Zbl Allg Path* 111(5): 517-520, 1968.

3197 **PRIMARY CYSTIC CARCINOMA OF THE LIVER.** *(E.)* Dean, D. L. (VA Hosp., San Fernando, Calif.) and H. M. Bauer. *Amer J Surg* 117(3):416-420, 1969.

3198 **STUDIES ON VARIABILITY OF MALIGNANT TUMOR.** *(Jap.)* Sasaoka, I. (Gifu U. Sch. Med., Japan). *Acta Sch Med Univ Gifu* 15(2):214-236, 1968.

3199 **TREATMENT OF HEPATIC ENCEPHALOPATHY.** *(E.)* Toghill, P. J. *Postgrad Med J* 45(521):227-229, 1969.

3200 **LIVER DISEASE AND MALABSORPTION.** *(E.)* Losowsky, M. S. (Gen. Infirm., Leeds, England) and B. E. Walker. *Gastroenterology* 56(3):589-600, 1969.

3201 **AMOEBIC ABSCESS OF THE LIVER. AUTOPSY STUDY OF 44 CASES.** *(E.)* Dave, J. K. (Dept. Clin. Path., Haffkine Inst., Bombay, India) and S. G. Subbuswami. *J J Group Hosp Grant Med Coll* 14(1):17-22, 1969.

3202 **ASPECTS OF ASCITES.** *(E.)* Knill-Jones, R. *Postgrad Med J* 45(521):220-222, 1969.

3203 **PRIMARY LIVER CANCER IN DAKAR.** *(Fr.)* Bourgom, J. J. *Lyon Med* 219(1):372-373, 1968.

3204 **HISTOCHEMISTRY AND ULTRASTRUCTURE OF THE DUBIN-JOHNSON SYNDROME. A REVIEW OF SIX CASES.** *(Sp.)* Oliva, H. (Jimenez Diaz Found., Dept. Path. Anat., Madrid, Spain), V. Navarro and A. Barat. *Rev Clin Esp* 110(5):397-406, 1968.

3205 **ICTERUS DURING DIABETES TREATED WITH SULFONYLUREA. A CLINICAL CASE OF ICTERUS CAUSED BY TOLAZAMIDE.** *(It.)* Rotolo, V. (Munic. Hosp., Friuli, Italy). *Friuli Med* 23(2):257-275, 1968.

3206 **REVIEW OF TWO CASES OF BLEEDING FROM THE DIGESTIVE APPARATUS IN PORTAL HYPERTENSION.** *(Por.)* Lemos Torres, U. (Santa Casa 2nd. Med. Svc., Sao Paulo, Brazil). *Arq Hosp Santa Casa* 14(2): 107-112, 1968.

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3207 **DEVELOPMENTS IN JAUNDICE.** *(E.)* Thompson, R. P. H. and R. Williams. *Postgrad Med J* 45(521):196-201, 1969.

3208 **IRON OVERLOAD.** *(E.)* Smith, P. M. *Postgrad Med J* 45(521):214-219, 1969.

3209 **FAMILIAL OCCURRENCE OF FORMIMINOTRANSFERASE DEFICIENCY SYNDROME.** *(E.)* Arakawa, T. (Dept. Pediat., Tohoku U., Sendai, Japan), T. Tamura, K. Ohara, K. Narisawa, K. Tanno, Y. Honda and O. Higashi. *Tohoku J Exp Med* 96(3):211-218, 1968.

3210 **ACCUMULATION AND RELEASE OF THYROID HORMONES BY THE NORMAL AND DISEASED HUMAN LIVER.** *(E.)* Zaninovich, A. A. (Dept. Med., U. Toronto, Canada), R. Volpé, R. J. Soto and C. Ezrin. *Acta Endocr* 60(3):412-422, 1969.

3211 **HEPATOGENOUS JAUNDICE IN PATIENTS WITH PULMONARY TUBERCULOSIS TREATED WITH VARIOUS REGIMENS OF ANTITUBERCULOUS DRUGS.** *(Pol.)* Kubiak, Z. (Acad. Med., Lódz, Poland). *Gruzlica* 36(11):1133-1135, 1968.

3212 **A REVIEW OF SOME RECENT TRENDS IN THE TREATMENT OF HEPATIC COMA.** *(E.)* Thomas, E. (Stanley Med. Coll., Madras, India). *Antiseptic* 66(3):193-195, 1969.

3213 **IMPAIRED AMMONIA METABOLISM IN SEVERE HEPATIC DISEASE.** *(E.)* Lechi, C. (Inst. Med. Path. U. Padua, Italy), A. Lechi and V. Lo Cascio. *Clin Chim Acta* 24(1):181-182, 1969.

3214 **VARIANT ALKALINE PHOSPHATASE IN HUMAN HEPATOCELLULAR CANCERS.** *(E.)* Warnock, M. L. (Dept. Pathol., U. Chicago, Ill.) and R. Reisman. *Clin Chim Acta* 24(1):5-11, 1969.

3215 **JAUNDICE–PATHOLOGY AND DIAGNOSIS.** *(E.)* Pai, K. M. (Kasturba Med. Coll., Mangalore, India). *Antiseptic* 66(2):143-150, 1969.

3216 **LIVER ABSCESSES.** *(E.)* Herbert, S. (Christian Hosp., Jagadhri, India). *J Abdom Surg* 11(5):96-102, 1969.

See also: 2618,2626,2630,2634,2641,2751,2756,2757,2765,2769,2770,2771,2783,2787,2793,2799,2800,2806,2807,
2808,2809,2811,2812,2813,2814,2819,2821,2828,2829,2830,2833,2834,2835,2836,2838,2848,2851,2852,
2854,2904,2921,3065,3113

3217 ATTACKS OF “PSEUDOLITHIASIS” OCCURRING IN THE COURSE OF CHRONIC ACTIVE HEPATITIS. *(Sp.)* Cavalle, F. (Fac. Med., Barcelona, Spain) and J. R. Malagelada. *Med Clin (Barcelona)* 51(3):311-316, 1968.

Detailed case reports are presented for 7 patients (2 men and 5 women, 36-72 yr old) with chronic active hepatitis in the precirrhotic phase, without cholelithiasis, who nevertheless presented with attacks of acute pain preceded by shivering and followed (in 4 and 5 cases, resp.) by fever and jaundice, which could not be distinguished from biliary colic. Six of the 7 patients had repeated attacks of this type, but the absence of cholelithiasis was demonstrated by X-ray in all 7, by the surgical findings in 3, and by autopsy in 1. The most common histological findings were hepatic necrosis, fibrosis, cellular infiltration and degenerative changes, while cholestasis was found in only 3 of 6 cases and neocanaliculi in 4 of 6. The value of liver biopsy in the diagnosis of patients with clinical evidence of cholelithiasis and normal X-ray findings is emphasized.

3218 A STUDY OF LIVER FUNCTION IN ALCOHOLICS WITH PULMONARY TUBERCULOSIS. *(Pol.)* Gryminski, J. (TBC Inst., Warsaw, Poland), J. Lyczewska, H. Styszewska and J. Walczak. *Gruzlica* 36(5):431-441, 1968.

Liver function studies in 62 heavy drinkers (all males) with pulmonary tuberculosis, representing about 13% of the 486 men with tuberculosis at the institution, revealed liver damage in only 21 cases (34%), and even in these the impairment was usually slight (the maximal 45-min BSP retention was 21%). Patients with and without liver damage were comparable with regard to duration and type of tuberculosis, associated illnesses, and the results of plasma protein studies. The BSP retention, which was abnormal in 20 of the 21 cases, was the most valuable test, since the other tests used (thymol turbidity, McLagen, serum transaminase levels, serum aldolase, serum bilirubin) failed to reflect the degree of liver damage; serum transaminases were elevated, for example, in 9-12 of the 21 cases, and the serum bilirubin was abnormally elevated in only 1 case. Alterations in the plasma proteins (decreased total protein in 19%, decreased serum albumin in 43%, and an abnormal albumin/globulin ratio in 52%) were ascribed to the tubercular process rather than to any effect of alcohol on the liver.

3219 PERFORATING INJURIES OF THE BOWEL COMPLICATING PERITONEAL CATHETER INSERTION. *(E.)* Simkin, E. P. (Liverpool Regional Urological Ctr., England) and F. K. Wright. *Lancet* 1:64-67, 1968.

During a 2-yr period 443 peritoneal dialysis catheters were inserted with 6 known abdominal viscus injuries. Five of these occurred in the first year and in each case the gut was perforated. A perfect record in the second year was spoilt by 1 bladder perforation. Severe intraabdominal hemorrhage occurred twice during the two years. Three of the patients with bowel perforations died.

3220 CLINICAL OBSERVATIONS ON 104 CASES OF AMEBIC LIVER ABSCESS. *(Kor.)* Han, Y. S. (Kyungpook Natl. U. Sch. Med., Taegu, Korea), H. M. Chung, Y. C. Kim, S. K. Doh, J. K. Park and J. S. Lee. *Korean J Intern Med* 11(10):615-623, 1968.

Needle aspiration or open biopsy were used to confirm the diagnosis of amebic liver abscess in 104 cases (87 males and 17 females, 73.9% in the 3rd or 4th decade) seen at Kyungpook University Hospital during the period 1961-67. A past or present history of diarrhea was noted in 40.3% of these cases. The most frequent complaint was upper abdominal pain (81.7%), and the most common finding was tenderness in the upper abdomen (92.3%). An incorrect tentative diagnosis was made in 30.8%. Localized bulging in the upper abdomen was present in 40.3%. BSP retention was over 10% in 46.9%, bilirubin levels were above 1.5 mg% in 27.1%, and a serum alkaline phosphatase of more than 10 Bodansky U was seen in 5.4%. The abscess was localized in the left lobe in only 4 cases. Septic complications were seen in 34.6% of the cases. Abnormalities in the chest X-ray were seen in about 90% of the patients, the most common being an elevation of the right diaphragm (77.5%). Therapeutic needle aspirations were required an average of 5 times per patient, with a total aspirate volume of less than 1000 cc in 71% of cases and over 3000 cc in 2 cases. The mortality rate in this group was 2.9%.

3221 ACUTE ALCOHOLIC HEPATITIS. *(It.)* Jori, G. P. (Inst. Med. Pathol., U. Naples, Italy) and G. Mazzacca. *Epatologia* 14(4):349-358, 1968.

A male, 30-yr-old university student with hematemesis, ascites, fever, slight jaundice, and coma was studied. A history of acute alcoholism was given. Laparoscopy showed an enlarged liver, with an irregular and reddish surface. Liver needle biopsy showed mainly polymorphonuclear inflammatory exudation in the lobe and in the portal spaces; fibrosis; fatty infiltration and degeneration of the hepatocytes, and intracellular Mallory bodies; necrosis. A diagnosis of acute alcoholic hepatitis and moderate portal fibrosis was made. Corticoid therapy was useful in treatment. The clinical, biochemical and histological relations between alcoholism and liver cirrhosis are discussed and reviewed.

3222 THE LIVER TOXICITY OF ORAL CONTRACEPTIVES: A CRITICAL REVIEW OF THE LITERATURE. *(E.)* Roman, W. (Inst. Med. & Vet. Sci., Adelaide, Australia) and R. Hecker. *Med J Aust* 2(16):682-688, 1968.

3223 GUANINE DEAMINASE ACTIVITY IN THE RAT KIDNEY, LIVER AND BLOOD DURING EXPERIMENTAL INTOXICATION WITH URANYL NITRATE. *(Fr.)* Bastide, J. (Nat. Counc. Sci. Res., Paris, France) and P. Bastide. *C R Soc Biol (Paris)* 162(5-6):1169-1171, 1968.

3224 A HISTOLOGICAL AND HISTOCHEMICAL STUDY OF THE TOXIC EFFECTS OF LITHOCOLIC ACID ON THE LIVERS OF ANIMALS. *(It.)* Albertini-Petroni, V. (S. Giacomo Hosp., Ctr. Study Liver Dis., Rome, Italy), A. Beni and G. Marinucci. *Epatologia* 14(2):127-135, 1968.

225 **A CASE OF GIANT-CELL HEPATITIS IN AN INFANT.** *(Pol.)* Modzelewska, I. (2nd Pediat. lin., Acad. Med. Lublin, Poland) and J. Cholewa. *Pediat Pol* 3(5):633-635, 1968.

226 **TUNNELED TRACT WOUNDS OF THE LIVER: REPORT OF A CASE.** *(E.)* Poticha, S. M. Northwestern U. Med. Sch., Chicago, Ill.). *Milit Med* 134(4): 84-286, 1969.

227 **ACUTE EFFECTS OF DIGOXIN INTOXICATION ON RAT HEPATIC AND CARDIAC ELLS. STRUCTURAL AND FUNCTIONAL CHANGES IN HE ENDOPLASMIC RETICULUM.** *(E.)* Arcasoy, M. M. Dept. Path. Pediat., U. Washington, Seattle) and E. A. muckler. *Lab Invest* 20(2):190-201, 1969.

228 **CARBON TETRACHLORIDE POISONING: A DISCUSSION OF ONE DEATH. A REVIEW OF A CASE OF CHLORINATED ALIPHATIC HYDROCARBON ABSORPTION.** *(Fr.)* Anonymous. *Bruxelles Med* 48(4):255-256, 1968.

3229 **TRAUMATIC LESIONS OF THE LIVER (CLINICAL TREATMENT: FOUR CASE REPORTS).** *(It.)* Morra, A. (Munic. Hosp. Cassino, Italy) and U. Pettinelli. *Gazz Int Med Chir* 74(4):345-356, 1969.

3230 **ACUTE HEPATIC NECROSIS FOLLOWING AN OVERDOSE OF PARACETAMOL. [CASE REPORT]** *(E.)* Toghill, P. J. (King's Coll. Hosp., London, England), R. Williams, J. D. Stephens and J. D. Carroll. *Gastroenterology* 56(4):773-776, 1969.

3231 **ACUTE COPPER SULFATE POISONING WITH JAUNDICE. [CASE REPORT]** *(E.)* Papadoyanakis, N., N. Katsilambros and B. Patsourakos. *J Irish Med Ass* 62(381):99-100, 1969.

See also: 2717,2718,2805

3232 **THE PATHOLOGICAL ANATOMY OF THE DYSTROPHIC AND CIRRHOTIC FORMS OF VIRAL HEPATITIS.** *(Ger.)* Zollinger, H. U. (Inst. Path., U. Freiburg/Br., Germany). *Munchen Med Wschr* 111(15):817-821, 1969.

A review of 10,000 unselected autopsies revealed 27 cases of hepatic dystrophy complicating viral hepatitis, including 7 of acute yellow dystrophy and 20 of subacute red dystrophy, 6 of which showed transition to postdystrophic cirrhosis. The liver weights, age distribution, and characteristic pathological findings in these 3 types are described in detail. The sequellae of postdystrophic, cholangitic and Laennec's cirrhosis are compared, and it is pointed out that hepatocellular carcinoma is a rare complication of postdystrophic cirrhosis (2 among 103 cases compared to 19 among 445 cases of Laennec's cirrhosis). It is concluded that the regenerative functions of the hepatic parenchyma are much less pronounced in postdystrophic cirrhosis. Depending on the relative degree of parenchymal damage and proliferative response, hepatic dystrophy can apparently result in either cirrhosis or chronic hepatitis.

3233 **ENZYMOLOGICAL EVALUATION OF THE STAGE OF RECOVERY IN PATIENTS WITH VIRAL HEPATITIS.** *(Pol.)* Drozdz, H. (2nd Clin. Int. Dis., Acad. Med. Krakow, Poland), A. Jedrychowski and K. Zasowska. *Pol Arch Med Wewnet* 42(4):621-625, 1969.

The serum GOT, GPT, lactic dehydrogenase, prothrombin complex, acetylcholinesterase, gamma-glutamyltranspeptidase and cystine aminopeptidase activities were compared with the results of the BSP test in 60 adult patients convalescing from viral hepatitis. Abnormal results for the prothrombin complex activity were obtained in 79.5% of 49 patients tested, compared to 41.3% for the gamma-glutamyltranspeptidase activity, 16.6% for the BSP test, 15.7% for SGOT, 12.2% for SGPT, 10.3% for acetylcholinesterase, 8.6% for cystine aminopeptidase and 5.7% for lactic dehydrogenase. It is concluded that gamma-glutamyltranspeptidase and the prothrombin complex are very valuable for evaluating the recovery from viral hepatitis, being a more accurate indicator of impaired liver function than the BSP clearance.

3234 **LAPAROTOMY IN VIRAL HEPATITIS.** *(E.)* Hardy, K. J. (Royal Melbourne Hosp., Australia) and E. S. R. Hughes. *Med J Aust* 1(17):710-712, 1968.

Thirty laparotomy patients with viral hepatitis proven by biopsy (27) or liver function tests (3) have been studied. There were 14 patients in the acute and 16 in the chronic phase of the disease. Follow-up was 4-8 yr. The postoperative course of 3 patients, 20-30 yr old, who had had appendectomies for right iliac fossa pain with normal appendices and developed the jaundice of viral hepatitis 1-2 days later, was uneventful. The same was true following 2 cesarean sections in patients jaundiced for 2 weeks. One of 9 viral hepatitis patients with a preoperative diagnosis of obstructive jaundice developed a mild tachycardia during the first 24 postoperative hr. Of 16 patients with chronic hepatitis diagnosed at laparotomy, 3 had a complicated postoperative course and 2 died.

3235 **CHROMATOGRAPHY OF SULFOBROMOPHTHALEIN AND THREE AMINO ACIDS CONJUGATED WITH IT IN THE SERUM OF PATIENTS WITH VIRAL HEPATITIS.** *(Pol.)* Kowalczyk, M. (Infect. Dis. Clin., Acad. Med., Warsaw, Poland) and H. Poznanska. *Pol Arch Med Wewnet* 42(1):47-53, 1969.

In 33 patients with viral hepatitis (13 acute, 10 convalescent and 10 chronic) and 10 controls, blood samples were taken 5, 20 and 45 min after an injection of BSP and subjected to 2-dimensional ascending paper chromatography using acetone-urea and butanol-acetic acid-water. The second chromatograms revealed glutathione and glutamic acid in both the "free-BSP" and "BSP metabolites" spots, together with cystine or cysteine in the latter. It is suggested that BSP may be conjugated with glutathione or glutamic acid before it reaches the liver.

3236 **PANCREATIC AND SMALL INTESTINAL ENZYMES DURING CHRONIC HEPATITIS AND CIRRHOSIS OF THE LIVER.** *(Rus.)* Valenkevich, L. N. (Leningrad Inst. Sanit. Hyg. Med., USSR). *Klin Med (Moskva)* 47(4):71-75, 1969.

Spontaneous and stimulated (0. 5% HCl and sunflower seed oil) pancreatic and duodenal secretion were studied in 43 patients with cirrhosis (12 decompensated) and 48 patients with chronic hepatitis (active in 33, inactive in 15). Pathological decreases in the secretion of trypsin, lipase, amylase and bicarbonate were observed in 88% of those with cirrhosis, 76% of those with chronic active hepatitis and 60% of those with inactive chronic hepatitis. In most cases of cirrhosis (but not active hepatitis), the duodenal enterokinase activity was also decreased, and the chloride content of the duodenal juice rose as the bicarbonate fell. There was a definite parallel between the severity of hepatic disease of all types and the degree of impairment of pancreatic lipase and trypsin secretion. Amylase activity was not strictly parallel, probably because amylase is also produced by other organs besides the pancreas. The alkaline phosphatase activity of the duodenal juice increased with the severity of cirrhosis, although it was depressed in active chronic hepatitis.

3237 **EFFECT OF GLUCOCORTICOID THERAPY ON BLOOD PYRUVIC ACID LEVELS IN THE COURSE OF VIRAL HEPATITIS.** *(Pol.)* Kita, R. (Infect. Dis. Clin., Acad. Med. Bialystok, Poland). *Pol Arch Med Wewnet* 42(4):643-647, 1969.

In 116 patients with viral hepatitis (74 males and 42 females, 16-67 yr old), the blood pyruvic acid, serum bilirubin, SGOT and SGPT were determined at 10-day intervals during the course of treatment. The blood pyruvate averaged 1.22 mg% in 32 patients with mild hepatitis, 1.59 mg% in 37 patients with intermediate degrees of hepatitis, 2.51 mg% in 31 patients with moderately severe hepatitis, and 2.39 mg% in 16 patients with severe hepatitis who were subsequently treated with glucocorticoids (Encorton Polfa, 650-700 mg/course p.o.); in controls, the blood pyruvate was 0.77 mg%. These values decreased by 57.4%, 63.8%, 64.1% and 69.3%, resp., during the 1st 10 days of treatment. It is concluded that patients with viral hepatitis show an elevation in blood pyruvate levels which is proportional to the severity of the disease, and that these levels drop during the course of successful treatment.

3238 MOUSE HEPATITIS VIRUS (MHV$_3$) INFECTION IN CHRONIC MURINE SCHISTOSOMIASIS MANSONI. *(E.)* Warren, K. S. (Western Res. U. Sch. Med., Cleveland, Ohio), M. S. Rosenthal and E. O. Domingo. *Bull NY Acad Med* 45(2):211-224, 1969.

Of 425 adult Swiss albino female mice (18-22 g), 282 were injected s.c. with 20 cercariae of a Puerto Rican strain of *Schistosoma mansoni.* At 8 and 16 weeks the worm burden of 10 animals was estimated and at 16 weeks the infected and control groups were each divided into 2 more groups, one of which was given 0.1 ml of undiluted mouse hepatitis virus (MHV$_3$) i.p. At 8 and 16 weeks all the animals were infected and 8 of 10 each time had bisexual infections. One of the mice with hepatitis alone (H), 2 with schistosomiasis alone (S) and 10 with schistosomiasis-hepatitis (S-H) died within 10 days after hepatitis was injected. In the H mice there was a splenic weight increase, a fall in albumin and a rise in globulin. In S mice the liver was also enlarged and in the S-H mice all these changes were most severe. Virus was detected in liver samples 1, 3, and 5 days after exposure to MHV$_3$ in 17 of 18 S-H mice and 6 of 18 H mice (virus titers at 5 days were resp. 4.04 and 18.76 TCID$_{50}$ per mg liver in the H and S-H groups). Typical focal destructive hepatic lesions were seen up to 5 days after exposure to the virus in 6 of 18 H mice; more severe lesions were seen in 10 of 18 S-H mice. There were no signs of chronic hepatitis 30 and 90 days after exposure to the virus. Parasitic disease may enhance the acute effects of hepatitis virus, but there is no evidence that a chronic cirrhosis-like picture results.

3239 SERUM TRANSAMINASES IN THE PREVENTION OF TRANSFUSION HEPATITIS. *(It.)* Teofili, M. T. (Inst. Clin. Chir. Gen., U. Rome, Italy) and G. Tucci. *Epatologia* 14(4):359-366, 1968.

The determination of SGOT and SGPT activity in 7500 potential blood donors showed possible hepatitis in only 1.58%. The low incidence was made possible by the careful selection of all would-be donors on the basis of extensive, and accurate histories and determinations of SGOT and SGPT.

3240 ANTILIVER ANTIBODIES DURING VIRAL HEPATITIS. *(It.)* Paci, P. (United Hosp., Florence, Italy) and G. P. Cirri. *Progr Med (Rome)* 24(21): 807-810, 1968.

One hundred fifty-two cases of acute viral hepatitis were studied (86 males and 66 females, with an average age of 28 yr and a range of 15 to 58 yr). Hemagglutination tests were carried out in these patients and in 30 patients without liver pathology. Antiliver antibodies were found in 10 of the 152 patients with viral hepatitis (titers of 1:10 in 3 patients, of 1:20 in 2, of 1:40 in 4, and 1:60 in 1). Repeat tests were positive in 6 patients. The antibodies disappeared rapidly and all tests were negative in 4 patients 30 days after onset. In 4 cases of leptospirosis and 8 cases of recurrent hepatitis tests were negative.

3241 AUSTRALIA ANTIGEN AND THE QUEST FOR A HEPATITIS VIRUS. *(E.)* Sutnick, A. I. (Inst. Cancer Res., Philadelphia, Pa.), W. T. London and B. S. Blumberg. *Amer J Dig Dis* 14(3):189-194, 1969.

3242 TREATMENT OF A CASE OF SERIOUS ICTERUS DUE TO HEPATITIS FROM INOCULATION BY GUERISON'S ORIGINAL METHOD OF EXCHANGE TRANSFUSION. [CASE REPORT] *(Fr.)* Muller, J. M. (Grenoble U. Hosp. Ctr., France), M. Guignier, D. Cordonnier, I. Bachelot, J. Miguet and X. Phelip. *Lyon Med* 221(7):331-339, 1969.

3243 CLINICAL SIGNIFICANCE OF THE ALKALINE RESERVE OF WHOLE BLOOD IN CHILDREN SUFFERING FROM EPIDEMIC HEPATITIS. *(Rus.)* Ismailova, M. Kh. (Pirogov Med. Inst. No. 2, Moscow, USSR) and I. I. Zubikova. *Vop Okhr Materin Dets* 13(12):34-37, 1968.

3244 BLOOD TRANSFUSION IN CHILDREN SUFFERING FROM EPIDEMIC HEPATITIS. *(Rus.)* Sharlai, I. V. (Leningrad Pediat. Med. Inst., USSR) and L. A. Isaeva. *Vop Okhr Materin Dets* 13(12):42-45, 1968.

3245 SOME INDICES OF BILE COMPOSITION IN CHILDREN WITH VIRAL HEPATITIS. *(Rus.)* Kubasova, E. G. (Med. Inst., Rostov-on-Don, USSR). *Vop Okhr Materin Dets* 13(12):30-34, 1968.

3246 CATALASE ACTIVITY OF SERUM AND HEPATIC TISSUE IN EXPERIMENTAL MURINE HEPATITIS BY MHV-3 VIRUS AND IN ACUTE EXPERIMENTAL CCl$_4$ POISONING. *(E.)* De Ritis, F. (Clin. Infect. Dis., U. Naples, Italy), G. Ruggiero and E. Filosa. *Enzym Biol Clin* 10(2):122-130, 1969.

3247 A STUDY ON THE DEVELOPMENT OF DISABILITY IN CHRONIC POSTVIRAL HEPATITIS. *(Fr.)* Georgescu, A. (Inst. Eval. Treat. Indust. Disability, Bucharest, Romania), E. Gulan, T. Georgescu, C. Comisioner and L. Grădinaru. *Epatologia* 14(2):3-8, 1968.

3248 CHRONIC HEPATITIS THERAPY. *(Rum.)* Fodor, O. (Inst. Med. Pharmacol., Cluj, Romania). *Med Intern (Bucur)* 20(10):1155-1160, 1968.

3249 FUNCTIONAL DISORDERS OF ALBUMIN TRANSPORT IN EPIDEMIC HEPATITIS AND CIRRHOSIS OF THE LIVER. *(Rum.)* Csőgőr, S. (Found. Sci. Res., Acad. Socialist Rep. Romania, Tirgu Mureş) and A. Nagy. *Med Intern (Bucur)* 20(10):1215-1218, 1968.

3250 ELECTROCARDIOGRAPHIC CHANGES AND ICTEROGENIC VIRAL HEPATITIS. *(It.)* De Pasquale, B. *Gazz Int Med Chir* 74(4):335-344, 1969.

3251 POST-HEPATITIS SYNDROME (A CLINICAL STUDY). *(E.)* Jayaram, B. M. (Bangalore Med. Coll., India). *Antiseptic* 66(3):171-172, 1969.

3252 AUSTRALIA ANTIGEN AND HEPATITIS. *(E.)* Blumberg, B. S. (Cancer Res., Fox Chase, Philadelphia, Pa.), A. I. Sutnick and W. T. London. *JAMA* 207(10):1895-1896, 1969.

3253 FURTHER STUDIES ON THE TRANSMISSION OF THE AGENT OF INFECTIOUS HEPATITIS TO PATAS MONKEYS. *(E.)* Bearcroft, W. G. C. (W. Afr. Counc. Med. Res., Yaba, Lagos, Nigeria). *Brit J Exp Path* 50(1):56-65, 1969.

3254 AN OUTBREAK OF INFECTIVE HEPATITIS AT GAUHATI–A STUDY. *(E.)* Lyngdoh, E. *Antiseptic* 66(2):83-90, 1969.

3255 INFECTIVE HEPATITIS. *(E.)* Pai, M. K. (Kasturba Med. Coll., Mangalore, India). *Antiseptic* 66(3):223-229, 1969.

3256 IMMUNE SERUM GLOBULIN FOR PREVENTION OF VIRAL HEPATITIS. *(E.)* Anonymous. *Indust Med Surg* 38(4):67-68, 1969.

3257 ENHANCING EFFECT OF THE MURINE SARCOMA VIRUS (MSV) ON THE REPLICATION OF THE MOUSE HEPATITIS VIRUS (MHV). *(E.)* Chany, C. (Saint Vincent de Paul, Hosp., Paris, France) and F. Robbe-Maridor. *Proc Soc Exp Biol Med* 131(1):30-35, 1969.

See also: 2622,3262,3263

3258 LONG-TERM SURGICAL RESULTS AND THE CHANGES IN WORKING CAPACITY IN PATIENTS WITH PORTAL HYPERTENSION. *(Rus.)*

Iemel'ianova, Iu. M. (Sci.-Res. Inst. Eval. Working Capacity, Leningrad, USSR). *Khirurgiia (Moskva)* 44(9):27-31, 1968.

The surgical techniques employed in 111 cirrhotic patients (68 men and 43 women) treated for portal hypertension and followed for periods of 1-10 yr or longer included portacaval shunt (27 cases), splenectomy with or without omentorenopexy (67 cases), splenectomy with splanchnic artery ligation (10 cases), splanchnic artery ligation alone (3 cases), and omentoreno- or omentohepatopexy (4 cases). Portacaval shunts were effective in 20 of 27 cases, while among 54 of the 77 patients subjected to splenectomy, 7 had recurrent bleeding. Analysis of the clinical status of these patients indicated that the type of surgery has little effect on the long-term results, the most important factor being the stage of the disease at the time of surgery. Regardless of the type of treatment, the working capacity was regained only slowly, and only 50% of the patients were ever able to return to work (generally to a job with reduced physical exertion).

3259 THE XYLOSE TEST IN CIRRHOSIS OF THE LIVER. *(Pol.)*

Kryszewski, A. (1st Clin. Int. Dis., Acad. Med. Gdansk, Poland). *Pol Arch Med Wewnet* 42(1):63-66, 1969.

A xylose absorption test (measurement of blood and urinary xylose levels for 5 hr after an oral dose of 5 g) was performed in 28 patients (16 men and 12 women, 16-74 yr old) with cirrhosis of the liver (including 18 with ascites) but normal kidney function, as well as in 14 controls (20-60 yr old). The maximal blood xylose level ranged from 9.06 to 20.65 mg% and was not significantly different in the 2 groups, averaging 12.83 mg% in cirrhotic patients with ascites, 12.00 mg% in those without ascites, and 16.21 mg% in controls (1-hr values). However, the disappearance of xylose from the blood tended to be slower in patients with ascites. The mean urinary xylose excretion in 5 hr was 1.13 ± 0.49 g in patients with ascites, 1.77 ± 0.45 g in those without ascites, and 1.78 ± 0.40 g in controls. The serum albumin was also somewhat lower in patients with ascites (2.5 g%) than in those without (3.1 g%).

3260 THE ETIOLOGY OF CIRRHOSIS OF THE LIVER. *(Ger.)*

Gleiniger, J. (Distr. Hosp., Magdeburg-Altstadt, Germany), G. Herms and K. A. Koelsch. *Z Aerztl Fortbild (Jena)* 63(1):30-33, 1969.

Among 250 patients with histologically confirmed cirrhosis of the liver (162 of whom had died before the end of the study), only 25 (10%) revealed no predisposing factors in their histories: 46.8% had a history of biliary tract disease (mostly including cholelithiasis), 27.2% were alcoholics, 18.8% and 16.4% had a history of hepatitis or intestinal disease, resp., 14% were diabetics, and 12.4-13.2% had a history of kidney disease or pulmonary tuberculosis (often treated with tuberculostatic drugs). A history of dietary protein deficiency was reported by only 5.3%. Almost all of these patients had more than one predisposing illness (usually 2-3), and some had 6 or more contributory factors. Among the 30.4% in which only one such factor could be found, however, it was biliary tract disease in 13.2%, alcohol or gastrointestinal disease in 4.8% each, and hepatitis or pulmonary tuberculosis in 2.4% each. Protein deficiency was not the sole factor in any of these patients, while 28.2-29.3% of those with biliary tract or gastrointestinal disease had these diseases as the only contributory factor, and another 47.5-43.9% had these diseases as the primary complication. Alcoholism, pulmonary tuberculosis and hepatitis were the sole etiological factor in 17.6%, 18.2% and 12.8% of the patients with these diseases, resp. It is concluded that biliary tract disease probably plays a significant role in the etiology of cirrhosis.

3261 URINARY HYDROXYPROLINE EXCRETION IN CIRRHOSIS OF THE LIVER. *(Ger.)*

Kratzsch, K. H. (Med. Clin., U. Leipzig, Germany). *Acta Hepatosplen* 16(1):2-8, 1969.

In 32 patients (24 males and 7 females, 16-71 yr old) with histologically confirmed cirrhosis of the liver, the 24-hr urinary excretion of total, bound and free hydroxyproline was significantly increased compared to that in controls (20 men and 12 women, 23-73 yr old, with compensated heart disease, functional symptoms, and uncertain diagnoses). The normal average values for bound and total urinary hydroxyproline, resp., were 32.5 and 33.5 mg/day in males and 27.3 and 28.2 mg/day in females; the corresponding values for the cirrhotic patients were 45.5 and 54.5 mg/day in males and 38.2 and 40.3 mg/day in females, the highest value for 24-hr bound hydroxyproline excretion being 103.9 mg. The increase in bound hydroxyproline is ascribed mainly to increased collagen metabolism, while that in free hydroxyproline is ascribed to disturbances in hepatic amino acid metabolism. There was no correlation between the urinary hydroxyproline excretion and the usual liver function tests, but this determination may provide additional information as to the activity of the disease process.

3262 STUDIES OF BONE MARROW FUNCTION IN PATIENTS WITH CHRONIC LIVER DISEASE: A CONTRIBUTION TO THE PROBLEM OF "HYPERSPLENISM". *(Ger.)*

Weinreich, J. (Med. Clin., Med. Acad. Lubeck, Germany). *Acta Hepatosplen* 16(1):18-24, 1969.

In 29 patients with chronic liver disease (20 with cirrhosis and 9 with chronic hepatitis, including 18 with portal hypertension and splenomegaly), bone marrow function was studied by determining the response of the peripheral leukocyte count to administration of the lipopolysaccharide Pyrexal (0.04 μg). The total leukocyte count increased by an average of 2240 ± 535/mm^3 in 17 of the 18 cases with portal hypertension and splenomegaly and by an average of 6160 ± 1374/mm^3 in the 11 patients without these complications. In both groups, there was also an increase in the proportion of immature granulocytes, the shift to the left being somewhat more pronounced in the second group. It is concluded that portal hypertension and splenomegaly have no effect on bone marrow function, but that a congested spleen and portal vein may play an increased role as a leukocyte reservoir.

3263 EPIDEMIOLOGICAL STUDIES ON THE PROBLEM OF POSTHEPATITIC CIRRHOSIS

OF THE LIVER. *(Ger.)* Kreig, D. (Eisenhuttenstadt Munic. Hosp., Germany) and E. Weigl. *Acta Hepatosplen* 16(1):25-34, 1969.

An epidemiological study of viral hepatitis in the Eisenhuttenstadt district during the period 1960-65 revealed 2 epidemics (in 1960 and 1965) with morbidity rates of 50.7-52.3/10,000; during these epidemics, the incidence rates were particularly high in children. In 1961 and 1964, the morbidity was only 17.7-18.1/10,000, and in 1962-63 it was only 3.5-6.7/10,000. Among the 923 cases of viral hepatitis recorded during this period in the district, 762 were followed for periods of 2-7 yr and 69 were subjected to liver biopsy. Complete recovery was observed in 82.2% of those followed, but the remaining 136 showed various sequellae: 4 patients with cirrhosis (3 men and 1 woman), 59 with chronic hepatitis (27 men and 32 women), and 73 with jaundice, biliary disease and/or neurasthenia. Although the 59 patients with chronic hepatitis were followed for 2-7 yr, none developed cirrhosis and the 4 patients who did develop cirrhosis did so immediately after recovery from the acute phase of hepatitis. The literature on the subject of post-hepatitic cirrhosis is critically reviewed.

3264 PRODUCTION OF NUTRITIONAL CIRRHOSIS IN *MACACCA MULATTA* MONKEYS. *(E.)*

Rutherford, R. B. (Johns Hopkins Hosp., Baltimore, Md.), J. K. Boitnott, J. S. Donohoo, S. Margolis, J. Sebor and G. D. Zuidema. *Arch Surg (Chicago)* 98(6):720-730, 1969.

Twelve *M. mulatta* monkeys (3100 to 4500 g), 8 males and 4 females) were placed on a diet virtually free of choline, with less than 5% protein content, and high in cholesterol. Studies were repeated after 3, 5, 8, 10, 12, 14, 16, 18, and 24 months on the diet and included total and direct bilirubin, alkaline phosphatase, BSP retention, SGOT, SGPT, total serum protein, the albumin globulin ratio, prothrombin time, serum urea nitrogen, sodium, chloride, potassium, cholesterol, creatinine, fasting blood sugar, hemoglobin and during the second year, blood ammonia. After 24 months an open wedge biopsy of the liver was obtained, portal pressure monitored, and direct portal phlebography performed. There was a progressive elevation of BSP retention, SGOT, SGPT, alkaline phosphatase, cholesterol, fatty infiltration and fibrosis. There was a fall in albumin with a rise in globulin during the first half year; total protein remained unchanged during the study. Portal pressures began to rise after 5 months, blood ammonia increased after 1 yr, and phlebography revealed portal venous blunting. Only 4 animals liver 24 months.

3265 ETIOPATHOGENESIS, CLINICAL ASPECTS AND THERAPEUTIC CRITERIA IN CHOLESTATIC HEPATOSCLEROSIS OF LITHIASIC ORIGIN.

(It.) Teofili, M. T. (Inst. Clin. Chir., U. Rome, Italy). *Epatologia* 14(4):367-377, 1968.

Three cases of cholestatic cirrhosis, after surgery for cholelithiasis, and 1 case of stones of the gallbladder and of the bile duct with an anicteric cholestatic cirrhosis are presented. In the last case, in spite of a lack of the clinical symptoms of angiocholitis, laboratory data (increase in bilirubin and in alkaline phosphatase, cholesterolemia and altered hepatic function) indicated biliary stasis. Preoperative radiologic examination showed stones of the gallbladder, without visualization of the bile duct. During cholecystectomy and the supraduodenal choledochoduodenostomy, stones of the gallbladder and of the bile duct were found. Intraoperative liver biopsy showed cirrhosis. Of the 4 cases, 1 recovered, 2 were improved and 1 died in hepatic coma.

3266 AMYLASE IN HEPATIC CIRRHOSIS STUDIED BY AGAR GEL ELECTROPHORESIS. *(It.)*

Ferri, S. (Inst. Clin. Gen. Med., U. Bologna, Italy), R. Di Feliciantonio, G. Bacci and L. Frizziero. *Riv Gastroent* 20(3):244-252, 1968.

Sera from 18 patients with cirrhosis, verified by clinical, laboratory, and biopsy findings, were studied for amylase activity by agar gel electrophoresis. Five groups were delineated: normal (3); a lower activity of all 4 bands (7); band 1 scarcely visible, but band 3 clearly increased (4); merging of bands 2 and 3 (2); and increased activity in bands 1 and 4 (2). The results indicate that serum amylase is of doubtful value in cirrhosis diagnosis, but may indicate pancreatic involvement.

3267 PROTEIN-LOSING ENTEROPATHY IN PATIENTS WITH LIVER CIRRHOSIS. *(E.)*

Davcev, P. (Med. Fac., U. Skopje, Yugoslavia), B. Vanovski, D. Sestakov and I. Tadzer. *Digestion* 2(1):17-22, 1969.

In 18 cases of advanced liver cirrhosis, enteral protein loss was evaluated by the ^{131}I polyvinylpyrrolidone (^{131}I-PVP) method. In 2 cases enteral ^{131}I-PVP excretion was markedly abnormal (11.0% and 3.12%) and peroral biopsy specimens of intestinal mucosa showed lymphangiectasia and cell infiltration. In 4 other patients ^{131}I-PVP excretion was only slightly (less than 3%) elevated. Portal hypertension and disturbed outflow of lymph in liver cirrhosis are possible causes for enteral protein loss. Albumin synthesis is not necessarily impaired in patients with liver cirrhosis even though the serum level is low. Gastrointestinal protein loss as a common clinical entity comparable to proteinuria could be significant in the reduction of total body protein pools in some cirrhotic patients.

3268 PORTACAVAL SHUNTS IN CIRRHOSIS.

(Fr.) Bel, M. A. (Red Cross Hosp., Lyon, France). *J Med Lyon* 49(1155):1985-2003, 1968.

3269 RADIOLOGICAL CHANGES OF THE ESOPHAGUS, STOMACH AND DUODENUM IN ALCOHOLIC CIRRHOSIS OF THE LIVER.

(Fr.) Alary, R. (Red Cross Hosp., Lyon, France) and B. Savoye. *J Med Lyon* 49(1155):2011-2020, 1968.

3270 OXYHEMOGLOBIN DESATURATION IN CIRRHOSIS. ALVEOLO-CAPILLARY SYNDROME DUE TO FIBROUS ALVEOLITIS IN A YOUNG WOMAN STRICKEN WITH BILIARY CIRRHOSIS.

(Fr.) Galy, P. (Lyon, France), J. Brune, T. Wiesendanger, M. Brune and F. Eyraud. *Bull Soc Med Hop Paris* 119(9):761-772, 1968.

3271 THE INCREASE OF LIVER CIRRHOSIS INCIDENCE IN PROSPEROUS COUNTRIES.

(Fr.) Anonymous *Rev Prat* 19(8):5-7, 1969.

3272 HEMATOLOGIC ABNORMALITIES IN THE ALCOHOLIC PATIENT.

(E.) Hardison, J. E. (VA Hosp., Atlanta, Ga.). *Med Times* 97(3):148-151, 1969.

3273 **CONTENT AND DISTRIBUTION OF NUCLEIC ACID (DNA AND RNA) IN HOMOGENATES OBTAINED BY LIVER BIOPSY FROM PATIENTS WITH CIRRHOSIS.** *(It.)* Gualà, L. (Inst. Med. Symptomatol., U. Naples, Italy). *Fegato* 14(4):577-592, 1968.

3274 **DISRUPTION OF SOME FUNCTIONS OF THE PANCREAS IN CIRRHOSIS COMPLICATED BY PORTAL HYPERTENSION.** *(Rus.)* Ashrapova, M. A. (Tashkent Med. Inst., USSR) and L. Kh. Panian-Gasparyan. *Med Zh Uzbek* (11):41-44, 1968.

3275 **INDIAN CHILDHOOD CIRRHOSIS.** *(E.)* Khanna, K. K. *Indian J Pediat* 35(245):285-287, 1968.

3276 **HYPERSPLENISM IN CIRRHOSIS.** *(E.)* Blendis, L. M. *Postgrad Med J* 45(521):223-226, 1969.

3277 **INFANTILE CIRRHOSIS OF THE LIVER IN TWINS.** *(E.)* Majumdar, D. K. (Dept. Pediat., K. G's Med. Coll., Lucknow, India), V. K. Kapoor and N. L. Sharma. *Indian J Pediat* 36(253):39-43, 1969.

3278 **INFANTILE CIRRHOSIS OF THE LIVER. A CORRELATIVE HISTOPATHOLOGICAL STUDY.** *(E.)* Patil, S. D. (Med. Coll. Aurangabad, India) and K. D. Sharma. *Indian J Pediat* 36(253):35-38, 1969.

3279 **CARDIAC HEMODYNAMICS IN ALCOHOLIC PATIENTS WITH CHRONIC LIVER DISEASE AND A PRESYSTOLIC GALLOP.** *(E.)* Gould, L. (VA Hosp., Bronx, N. Y.), M. Shariff, M. Zahir and M. Di Lieto. *J Clin Invest* 48(5):860-868, 1969.

3280 **PROTEIN SUPPLEMENTATION DURING THE INITIAL HOSPITALIZATION OF ALCOHOLICS.** *(E.)* Corley, K. C. Jr. (Med. Coll. Virginia, Richmond) and E. C. Hoff. *Quart J Stud Alcohol* 29(4):931-938, 1968.

See also: 2694,2709,2797,2827,3041,3236,3249

3281 **THE CAUSES OF COMPLAINTS FOLLOWING OPERATIONS ON THE BILIARY TRACT.** *(Ger.)* Schwarz, W. (Med. Clin., U. Heidelberg, Germany), B. Kommerell, K. H. Grözinger, D. Krumhaar and H. W. Schüler. *Munchen Med Wschr* 111(15):859-863, 1968.

Among 948 patients subjected to cholecystectomy for extrahepatic biliary disease between 1943 and 1962, 357 reported postoperative symptoms (pain and colic, fat intolerance, feeling of fullness, meteorism, constipation, nausea, vomiting, and weight gain). Detailed follow-up studies, including relaparotomy, on 160 of these patients (35 males and 125 females, average age 54 yr) revealed histologically-proven hepatic lesions or disorders of the bile ducts (as shown by i.v. cholangiography) in about 33%. Only 10 of these patients, however, had stones in the common bile duct or cystic stump, and none of these 10 had increased serum alkaline phosphatase levels. In another 33%, the presence of similar lesions was suggested by abnormal liver function tests (BSP, plasma proteins, serum bilirubin) and the clinical findings, but in the last 33% there was no evidence of organic biliary tract disease or liver damage.

3282 **SOME ASPECTS OF SURGERY ON THE SPHINCTER OF ODDI.** *(Fr.)* Arianoff, A. A. (St. Elisabeth Hosp., Brussels, Belgium), G. Vielle and P. Van Reepinghen. *Acta Chir Belg* 67(8):779-797, 1968.

The indications, contraindications, techniques, complications and results of Oddi sphincterotomy are discussed on the basis of 378 personal cases (including 190 patients over the age of 60) and more than 5000 similar operations reported in the literature. Sphincterotomy was performed in 15.3% of 2468 patients operated on for nonmalignant biliary tract disease, mostly because of stones located low in the common bile duct or ampulla or because of stenotic inflammation of the sphincter. In 102 cases, the sphincterotomy was complemented by external (75 cases) or internal (27 cases) biliary drainage. Surgical errors in 4 cases were of little consequence, but there were 8 postoperative deaths (2.1%, including 3 elderly patients who died of heart failure, 2 cases of acute pancreatitis, 1 of hemorrhage, 1 of decompensated cirrhosis, and 1 of choledochal fistula). The mortality rate of 2.1% could be compared with an overall rate of 2.2% among all 2468 patients operated on for nonmalignant biliary disease, and with a rate of 4.5% for patients with acute cholecystitis. Postoperative complications developed in 37 cases, but only 10 of these could be related in any way to the sphincterotomy (hemobilia, biliary tract fistulas, subphrenic or perinephric abscess, acute gastric dilatation, and excessive fluid loss through the drain). Among 326 surviving patients, there were only 6 true failures and 16 with minor disorders, yielding 93.1% with excellent results. It is concluded that sphincterotomy yields no increase in morbidity or mortality following biliary tract surgery and is the procedure of choice in most conditions involving the sphincter and lower duct. The long-term results are superior to those of other techniques, particularly when the type of sphincterotomy is properly chosen on the basis of cholangiographic findings.

3283 **THE ENTEROHEPATIC CIRCULATION OF SULFOBROMOPHTHALEIN SODIUM. RESULTS OF A STUDY ON 24 PATIENTS.** *(E.)* Deshpande, S. Y. (Washington D. C. Gen. Hosp.). *Med Ann DC* 37(3):164-166, 1968.

The enteric absorption of BSP (10.0 mg/kg body weight, p.o.) was studied in 24 patients (18 men and 6 women; 11 with Laennec's cirrhosis, one with hepatomegaly and the remaining 12 with no evidence of liver disease). The BSP was detected in the serum as early as 15 min in some of the patients without liver disease but was not absorbed in 60 min by 8 of 9 patients with Laennec's cirrhosis. Since the serum concentration of BSP is usually 2-3% in patients without liver disease and 0% in patients with Laennec's cirrhosis for the first-hr period, it seems that the enterohepatic circulation of BSP does not affect the efficiency of the BSP test for hepatic function when a dose of 5 mg/kg is used.

3284 **BILIARY DYSKINESIA IN GASTRO-DUODENAL ULCER.** *(It.)* Rocchi, V. (Inst. Gen. Surg., U. Rome, Italy), A. F. Maccioni and P. B. Sandona. *Fegato* 14(3):335-339, 1968.

Radiological examination of the biliary tract in 311 patients (271 with duodenal and 40 with gastric ulcers) revealed no pathological alterations in 71.7%. A reduced cholecystic concentrating activity was found in 15 (4.8%), 2 of whom had gastric and 13 had duodenal ulcers. Alterations in tonus and cholecystic motility were found in 29 (9.3%), 3 with gastric and 26 with duodenal ulcers. Alterations in hepatobiliary tonus and motility were observed in 12 (3.9%), all of whom had duodenal ulcers. The frequency of these functional changes was almost identical in the 2 types of ulcer.

3285 **PERCUTANEOUS TRANSHEPATIC CHOLANGIOGRAPHY: A REPORT OF 19 CASES.** *(E.)* Miller, W. D. (Royal Prince Alfred Hosp., Sydney, Australia). *Med J Aust* 1(20):835-836, 1968.

Percutaneous transhepatic cholangiography was performed in 19 patients for the following indications: known or suspected biliary stricture; to distinguish cholangiolytic from hepatic duct obstruction; and to exclude a surgically remedial cause of jaundice. Twelve of the patients had had previous biliary surgery (3 of them for biliary stricture); most were jaundiced and of these, 3 were considered too poor a risk for diagnostic surgery. The diagnoses in the 13 patients successfully examined by this method included carcinoma of the head of the pancreas (3), impacted stone at the ampulla of Vater (1), duct carcinoma (3), primary biliary stenosis (1), stenosing cholangitis (2), and postoperative biliary stricture (3). In 1 case bleeding into the bile ducts occurred.

3286 **SURGICAL TREATMENT OF PORTAL HYPERTENSION.** *(E.)* Harjola, P. T. (Kemi Cent. Hosp., Finland) and E. Laustela. *Ann Chir Gynaec Fenn* 57(1):40-44, 1968.

Thirteen patients, mean age 40 with a 1:1 sex ratio, underwent portal decompression for esophageal varices and portal hypertension. Nine had cirrhosis and 4 portal thrombosis. Hematemesis and melena necessitated 12 procedures and 1 rophylaxis. Side to side portacaval shunts were made in 6 patients, end to side in 3, splenorenal shunts in 4, and in 2 patients whose recurrent esophageal bleeding required reoperation nesentericocaval shunts were made. Both of these latter had ortal thrombosis. Two cirrhosis patients with varying amounts f hepatic reserves died postoperatively, one of a myocardial nfarction. One patient died 23 months after surgery due to ommon duct stones and obstructive jaundice. The remaining 0 have been followed for an average of 39 months; 7 of the 8 X-rayed have clear varices. Splenoportography and differential glucose tests indicated shunt patency in 6. Only 2 patients suffered from mild encephalopathy.

3287 **BENIGN STRICTURE OF THE BILE DUCTS.** *(E.)* Stewart, G. R. (Royal Prince Alfred Hosp., Sydney, Australia). *Med J Aust* 1(20):838-841, 1968.

Previous cholecystectomy was implicated as the cause of 28 of the 29 cases of benign extrahepatic bile duct strictures noted during a 6 yr retrospective study. In 11 of the 28 cases, exploration of the common bile duct was performed and in 10 of these T-tube drainage was used postoperatively. The 1 nontraumatic stricture followed a pericholedochal abscess. In 1 of the 28 operative cases there was acute edematous cholecystitis and in another empyema of the gallbladder. Three anomalies in Calot's triangle were noted, and 12 cases of chronic fibrotic cholecystitis: 2 retrograde cholecystectomies were performed, and in 2 cases hemostasis was difficult. An average 10 months elapsed before the effects of stricture necessitated repair. Two cases were recognized at surgery and 2 in the immediate postoperative period. Clinical jaundice was present in 23 cases. Recurrent cholangitis occurred in 11 cases. Over 70% of the cases had an elevated alkaline phosphatase and bilirubin with bile in their urine. A total of 46 attempts were made to relieve the strictures. Duct dilatation and T-tube drainage was repeatedly unsuccessful. There were 2 deaths, 9 patients had complete relief, 6 had recurrent symptoms and 12 were lost to follow-up.

3288 **MALFORMATIONS OF THE EXTRAHEPATIC BILE DUCTS.** *(Fr.)* Mester, E. (2nd Surg. Clin., U. Budapest, Hungary) and J. Molnar. *Lyon Chir* 65(1):5-14, 1969.

Among 1200 patients subjected to biliary tract surgery under cholangiographic control during the period 1957-67, 160 had various biliary tract anomalies: 35 with accessory hepatic ducts, 56 with cystic duct anomalies, 67 with irregularities in the common bile duct, and 2 with variations in the region of the ampulla. Pancreatic reflux was noted in a total of 214 cases, 167 of which had a common point of entry of the pancreatic duct and common bile duct into the duodenum. These statistics are compared with those in the literature, and some of the surgical consequences of such undetected anomalies are pointed out. Preoperative cholangiography is urgently recommended as a precautionary measure in all cases.

3289 **THE POSTOPERATIVE EVALUATION OF THE FUNCTION OF PAPILLA AND ITS CONSEQUENCES.** *(Ger.)* Mattig, H. (St. George Dist. Hosp., Leipzig, Germany) and H. J. Hitschfeld. *Zbl Chir* 93(22):771-777, 1968.

In 36 patients the function of the papilla was evaluated immediately after surgery and until normalization took place by means of residual pressure determinations, measurements of bile flow, and cinematography of the papilla. Initially, in 80% of the patients the residual pressure and the bile flow were altered pathologically. Seventy-two hr postsurgery the residual pressure and the bile flow had returned to normal in 94.5% of the patients and in 100% 96 hr postsurgery. After common bile duct surgery some pathological sphincter activity is to be expected since the sphincter of Oddi reacts to mechanical irritation with a distinct prolongation of the contraction phase, i.e., spasm. Greater irritation results in edema. The study of the 36 patients and an examination of the results of 28,950 gallbladder procedures confirms that T-drainage is the safest treatment method for most choledochotomies. In all routine choledochotomies the T-drain can be completely clamped on the 3rd postoperative day; thereby eliminating many of its disadvantages.

3290 **CARCINOMA AT THE JUNCTION OF THE MAIN HEPATIC DUCTS.** *(E.)* Whelton, M. J. (Royal Free Hosp., London, England), M. Petrelli, P. George, W. B. Young and S. Sherlock. *Quart J Med* 38(150):211-230, 1969.

The clinical, biochemical, pathological, radiological and surgical features of 23 patients with carcinoma of the hepatic duct junction were analyzed. Abdominal exploration had been performed in 17 patients and no biliary obstruction discovered. In every instance the significance of the collapsed gallbladder and bile ducts in the presence of a turgid, enlarged liver was not recognized. Men (13) were affected slightly more than women (10). Histology of the liver can show clear evidence of extrahepatic biliary obstruction. A needle biopsy specimen is adequate. The most valuable radiological examination is percutaneous transhepatic cholangiography which confirmed the diagnosis in 20 patients and which was also useful in the selection of the proper surgical procedures. Biochemical findings were the nonspecific ones of cholestasis. Serological testing for mitochondrial antibodies gave negative results. Hepatic scintiscanning was sometimes misleading and needed cautious interpretation. Poor uptake of isotope did not necessarily indicate the presence of secondary deposits of carcinoma of the liver. Patients who had been treated with corticosteroids did not withstand surgery as well as others. The combination of obstructive jaundice in a middle-aged patient with hepatomegaly, no splenomegaly and a collapsed gallbladder and bile duct at laparotomy is almost diagnostic.

3291 **CARCINOMA OF THE EXTRAHEPATIC BILE DUCTS.** *(E.)* El-Domeiri, A. A. (Mem. Hosp. Cancer Allied Dis., New York, N. Y.), R. D. Brasfield and J. L. O 'Quinn. *Ann Surg* 169(4):525-532, 1969.

3292 **EFFECT OF GASTRECTOMY ON BILIARY DYNAMICS.** *(E.)* Wyatt, A. P. (War Mem. Hosp., Woolwich, London, England). *Gut* 10(2):91-93, 1969.

3293 **BILIARY PERITONITIS DUE TO PERFORATION.** *(Fr.)* Barraya, L., J. P. Borelli and R. Lauriere. *Rev Prat* 19(4):457-465, 1969.

3294 BI-LOBED GALLBLADDER OF CONGENITAL ORIGIN. [CASE REPORT] *(Fr.)* Seror, J. B. Mentouri and B. Meradji. *Mem Acad Chir (Paris)* 95(1-2-3): 41-47, 1969.

3295 CHOLECYSTIC BLEEDING. *(It.)* Tartato, S. (E. Daniele-E. Romasi Munic. Hosp., Lecce, Italy). *Rass Int Clin Ter* 48(22):1412-1416, 1968.

3296 INDICATIONS FOR THE SURGICAL TREATMENT OF CARRIERS OF SALMONELLAE IN THE BILIARY TRACT. *(Sl.)* Hrůzik, J. (Med. Fac., Comensky U., Bratislava, Czechoslovakia), P. Černák, F. Miček and V. Pišút. *Bratisl Lek Listy* 50(5):659-666, 1968.

3297 PERSONAL EXPERIENCE WITH SPHINCTEROTOMY IN 1012 CASES. *(Sp.)* Llauradó, A. (S. Cruz S. Pablo Hosp., Barcelona, Spain) and R. Trias. *An Hosp S Cruz S Pablo* 28(4):277-290, 1968.

3298 GALLBLADDER AGENESIS. *(Por.)* Massiere, F. and V. S. De Mello. *Brasil Med* 82(4):266-267, 1968.

3299 NEW TRENDS IN BILIARY SURGERY. *(Ger.)* Mester, E. (2nd Surg. Clin., Med. U. Budapest, Hungary). *Acta Chir Acad Sci Hung* 9(4):449-467, 1968.

3300 BILE-PLUG SYNDROME: A CORRECTABLE CAUSE OF OBSTRUCTIVE JAUNDICE IN INFANTS. *(E.)* Bernstein, J. (Albert Einstein Coll. Med., Bronx, N. Y.), R. Braylan and A. J. Brough. *Pediatrics* 43(2):273-276, 1969.

3301 PYLORIC OBSTRUCTION SECONDARY TO ACUTE CHOLECYSTITIS AND PERICHOLECYSTITIS. *(E.)* Frederick, W. C. (St. Vincent's Med. Ctr. Richmond, Staten Island, N. Y.). *Amer J Gastroent* 51(4):293-297, 1969.

3302 IMPORTANCE OF THE SIZE OF THE STOMA IN CHOLEDOCHO-DUODENOSTOMY. *(E.)* Johnson, A. G. (Charing Cross Hosp., London, England) and A. E. Stevens. *Gut* 10(1):68-70, 1969.

3303 CARCINOMA OF BILE DUCTS IN HUSBAND AND WIFE. *(E.)* McCarthy, C. F. (Royal Infirm., Bristol, England) and H. J. Espiner. *Gut* 10(2):94-97, 1969.

3304 VAGOTOMY IN BILIARY TRACT DISEASE. *(E.)* Anonymous. *Roche Med Image* 11(2):6-9, 1969.

3305 A SYSTEMATIC PLAN FOR HEPATIC DUCT EXPLORATION. *(E.)* Glassman, J. A. (Jackson Mem. Hosp., Miami Beach, Fla.). *Amer Surg* 35(6):412-417, 1969.

3306 CONCRETIONS IN THE PANCREATIC DUCT DIAGNOSED BY CHOLANGIOGRAPHY. [A CASE REPORT] *(E.)* Andersson, C. A. (U. Umea, Sweden), C. Edstrom, G. F. Saltzman and B. Schampi. *Acta Radiol* 8(2): 183-186, 1969.

3307 CHOLEDOCHAL CYST. *(E.)* Rohatgi, S. K. (Sofdarjang Hosp., New Delhi, India), S. K. Bhargava and S. Ghosh. *Indian Pediat* 5(10):472-474, 1968.

3308 DIABETIC CHOLECYSTOMEGALY. *(E.)* Bloom A. A. (Bronx-Lebanon Hosp. Ctr., N. Y.) and R. Stachenfeld. *JAMA* 208(2):357-359, 1969.

3309 EMPHYSEMATOUS CHOLECTYSTITIS: REPORT OF TWO CASES. *(E.)* Palmisano, D. J. (Dept. Surg., Tulane U. Sch. Med., New Orleans), S. H. Roberson and W. A. Guynes. *J Louisiana Med Soc* 121(5): 158-161, 1969.

3310 BILIARY DISEASE AND ADVANCING AGE. *(E.)* Hermann, R. E. (Cleveland Clin. Found., Ohio) and J. C. Martin. *Geriatrics* 24(4):139-145, 1969.

3311 ACUTE CHOLECYSTITIS IN THE DIABETIC. *(E.)* Schein, C. J. (Albert Einstein Coll. Med., Bronx, N. Y.). *Gastroenterology* 51(6):511-515, 1969.

3312 STUDIES ON ETIOLOGY OF STRAWBERRY GALLBLADDER: EXPERIMENTAL PRODUCTION AND CHEMICAL COMPOSITION OF BILE. *(Jap.)* Nabeyama, K. (Fac. Med., Kyushu U., Fukuoka, Japan). *Acta Med (Fukuoka)* 38(6):717-734, 1968.

See also: 2652,2782,2784,2816,2832,2860,3039,3118,3152,3265

GENERAL

3313 **DEVELOPMENT OF A TECHNIQUE FOR PERITONEAL DIALYSIS WITH KANAMYCIN N DIFFUSE PERITONITIS.** *(Rus.)* Fedorov, V. D. (N. I. Pirogov 2nd Moscow Med. Inst., USSR), E. F. Saksen, V. I. Maksimov, L. K. Rubtsova and V. G. Koroleva. *Khirurgiia (Moskva)* 44(9):54-60, 1968.

During recent years, 70 patients with diffuse peritonitis resultng from acute appendicitis, perforation of the small bowel due o ulcers or injuries, intestinal obstruction, and other diseases have been treated by irrigation of the abdominal cavity and flowing peritoneal dialysis against saline containing kanamycin or monomycin at a concentration of 1 g/liter. Results have been satisfactory, with cures being obtained, for example, in 13 of 16 cases of acute appendicitis and 9 of 11 cases of small bowel injury. Detailed clinical and laboratory studies of the kanamycin concentration in the blood, urine and irrigation fluid were carried out in 15 of these patients (11 males and 4 females, 13-73 yr old), treated for stage I (3 cases), stage II (8 cases) or stage III (4 cases) peritonitis due to acute appendicitis (9 cases), perforated peptic ulcer (2 cases), small bowel injury (1 case), intestinal obstruction (1 case) or previous surgery (2 cases). These determinations showed that an irrigation rate of 2-3 liters/day is insufficient to ensure proper dialysis and an adequate level of kanamycin in the bloodstream. Only a rate of 5 liters/day, maintained for 3 days, is able to guarantee a kanamycin concentration of 10-20 μg/ml. The satisfactory clinical results obtained at this rate also indicate that absorption of antibiotic from the abdominal cavity remains good in cases of diffuse peritonitis.

3314 **ABDOMINAL SYNDROMES DUE TO VISCERAL DISPLACEMENT CAUSED BY A DECREASE IN INTRAABDOMINAL PRESSURE.** *(Sp.)* Gallego Tejedor, M. (Reina Victoria Soc. Security Hosp., Madrid, Spain). *Rev Esp Enferm Apar Dig* 27(7):969-984, 1968.

Based on a review of 8 personal cases and a theoretical discussion of the dynamic interactions between the diaphragm, abdominal wall and the distribution of the internal organs, it is concluded that a drop in pressure in a particular region of the abdomen plays an etiological role in the signs and syndromes of visceral displacement, caused by the tendency of the hollow organs to fill a partial vacuum. The most characteristic symptoms of this condition are pain and disturbances in transit through the hollow organs. In asymptomatic cases, the X-ray findings can easily lead to erroneous diagnoses. In the present series, the drop in intraabdominal pressure and consequent visceral displacement (complicated by volvulus and stenosis) were caused by atrophy of the left lobe of the liver, partial hepatectomy for hydatid cysts, partial gastrectomy, and paralysis or malformation of the diaphragm. In general, this syndrome can be caused either by a loss of abdominal contents (atrophy or surgery), an increase in abdominal capacity (hernia or anomalies of the diaphragm), or by a redistribution of the abdominal contents resulting in localized increases and decreases in pressure (the upper abdominal syndrome of athletes).

3315 **EVERTING SUTURE OF THE BOWEL: EXPERIMENTAL AND CLINICAL EXPERIENCE IN DUODENAL CLOSURE AND COLORECTAL ANASTOMOSIS.** *(E.)* Buyers, R. A. (Sacred Heart Hosp., Norristown, Pa.) and L. A. Meier. *Surgery* 63(3):475-480, 1968.

When simple one-layer everting sutures were used to close the duodenum following partial gastrectomy in 5 miniature pigs, there was no evidence of leakage 1-10 weeks later and the surface of the bowel was macroscopically smooth with little formation of adhesions. Excellent results were also obtained by this method in 3 patients with stenotic postbulbar duodenal ulcers and dilatation of the stomach and pylorus, as well as in 2 patients with routine duodenal closures and in 1 patient with edema and scarring of the mucosa and erosion of the duodenal ulcer through the posterior segment of the duodenum into the pancreas. Colorectal anastomosis was also performed in miniature pigs by the everting suture technique (anchoring the distal mucosa to the serosa of the proximal invaginated segment of bowel), following resection of the sigmoid; the postoperative course was uneventful in all cases, and autopsy after 1-8 weeks revealed a smooth suture line with an almost imperceptible line of anastomosis. Among 9 patients (4 men and 5 women, 41-78 yr old) treated in this way (for diverticulitis, carcinoma, rectal prolapse or fecal impaction), there was only one failure (a fecal fistula, which could have been avoided by using the method of Black, in a 63-yr-old woman treated for carcinoma of the mid-rectum).

3316 **THE EFFECT OF HOSPITALIZATION AND ANTIBIOTIC THERAPY ON GRAM-NEGATIVE FECAL FLORA.** *(E.)* Rose, H. D. (Marquette U. Sch. Med., Milwaukee, Wis.) and J. Schreier. *Amer J Med Sci* 255(4): 228-236, 1968.

The fecal carrier rate of the common gram-negative bacilli was determined in 234 patients on the day of hospitalization at a large Veterans Administration Hospital. Of the original 234 patients 100 were available for repeat study after 21 days. Fifty of these served as controls and did not receive antibiotics. Fecal flora was unchanged in this group. All of the 50 patients in the other group had received at least 5 days (median of 10.1 days) of antibiotics for infections. The total number of strains of gram-negative bacteria other than *E. coli* was significantly greater after 3 weeks. The carrier rate of *Klebsiella pneumoniae* increased from 10 to 34%. Pencillin G, ampicillin, and antibiotic combinations caused the greatest alteration in fecal flora. The acquisition of fecal gram-negative bacteria other than *E. coli* was secondary to antibiotic therapy.

3317 **AN OUTBREAK OF GASTRO-ENTERITIS ASSOCIATED WITH ECHOVIRUS TYPE 1.** *(E.)* Field, P. R. (Inst. Clin. Pathol. Med. Res., Lidcombe, Australia), A. M. Murphy, H. B. Gibson and T. F. Rennie. *Med J Aust* 1(1):9-11, 1968.

Fifty-eight patients, including 3 adults, with vomiting and diarrhea were hospitalized during a 10-week period. The majority of the children were between 2 weeks and 2 yr of age, and of the aboriginal population. Three children died early in the outbreak. All patients came from in and around a small town. House to house and mass media explanations encouraged the elimination of flies. The cultured feces of 6 of 11 children yielded echovirus type 1 as did 2 of the water samples tested.

3318 **ALCOHOLISM IN DUBLIN.** *(E.)* Walsh, D. (St. Loman's Hosp., Palmerstown, Ireland). *J Irish Med Ass* 61(371):153-156, 1968.

During 1962 there were 169 first admissions to psychiatric hospitals in Dublin for alcoholism, 139 male and 30 female. For males this was a crude rate of 63.4, and for females 11.2 per 100,000 population. The widowed male was at greatest risk, but with age adjustment the married male was at less risk than those single. The married female still shows a rate double that of the spinster even after adjustment. There were 300 readmissions with the same diagnosis and similar male to female ratios and crude rates of incidence were noted.

3319 **THE TREATMENT OF INTUSSUSCEPTION: THIRTY YEARS' EXPERIENCE AT GOTHENBURG'S CHILDREN'S HOSPITAL.** *(E.)* Bjarnason, G. (Gothenburg's Child. Hosp., Sweden) and G. Pettersson. *J Pediat Surg* 3(1):19-23, 1968.

During the years 1936-1966, 428 cases of acute intussusception were treated at the Gothenburg's Children, Hospital, Sweden. Of these, 221 cases were treated by hydrostatic reduction alone with simultaneous roentgen control, and 207 cases underwent surgery. Intestinal resection was performed on 10 of the 207 surgical cases, either followed by entero-enterostomy or exteriorization following Miculicz' method. There were 11 deaths before 1953, but no mortality since 1954. This combined treatment is highly recommended, and the necessity of preoperative fluid balance is underlined.

3320 **INFANTILE GEOHELMINTHIASIS IN THE MIDDLE AND LOW BASIN OF SESIA RIVER WITH REFERENCES TO THE SOCIO-ECONOMICAL AND HYGIENIC FAMILIAL CONDITIONS AND TO SCHOLASTIC EFFICIENCY.** *(It.)* de Carneri, I. (Inst. Parasitol., U. Pavia, Italy) and P. T. Ricciardiello. *G Mal Infett* 20(4):358-368, 1968.

Samples of the feces of 330 school children, living in the river Sesia area, were examined. Trichuriasis was found in 91 (27.6%), and in 8 (2.4%) associated with ascariasis. The Trichuriasis burden, measured by egg output, was modest: only in 4.2% was it higher than 2000 egg/g of feces. The Ascaris burden was lower than 26,400 egg/g. The higher percentage of parasitosis was found in children from poor families and socio economically depressed areas. There was no significant correlation between parasitosis found and low results at school, both were caused by familial conditions.

3321 **AMBILHAR IN THE TREATMENT OF SCHISTOSOMIASIS MANSONI.** *(E.)* Fadl, A. (Fac. Med., U. Khartoum, Sudan), M. Hussein and M. A. Haseeb. *J Trop Med Hyg* 70(10):255-258, 1967.

Twenty-five patients were treated with Ambilhar (niridazole; nitrothiamidazol) for infestation with *Schistosoma mansoni.* All were in-patients, and were kept under strict medical supervision for about 4 months. Stools were examined directly by concentration and the hatching methods. Antihistamine tablets were given concomittantly to 7 patients during treatment with Ambilhar for 7 days to prevent allergic reactions to protein from the worms killed by the latter drug. However, 3 patients developed severe toxic effects. Severe side reactions also developed in 3 of 18 patients who did not receive antihistamine orally; they were given antihistamine by injection. Antihistamines did not seem to prevent the side effects. The stools of 24-25 patients became free of *Schistosoma mansoni* ova 4-10 days after treatment and remained so during the 4-month follow-up. Signs and symptoms of infestation (blood, mucus and ova in the stools) developed in 1 patient 58 days after treatment. Side effects were mild in 16 and severe in 6 patients. Enlarged livers were present on admission in 8 patients, 3 of whom experienced severe side effects. Liver enlargement was not observed in 3 others who experienced severe side effects. The side effects lasted in some cases for 14 days after initiation of treatment; they eventually disappeared without permanent disability.

3322 **THE INCIDENCE OF INTESTINAL DIVERTICULOSIS IN PATIENTS WITH TUBERCULOSIS.** *(It.)* Emanuele, B. (S. Luigi Gonzaga Hosp., Turin, Italy), A. Bignamini and U. Ferraro. *Minerva Med* 60(24):1095-1105, 1969.

A review of 500 gastrointestinal X-ray studies, 284 autopsy reports on patients dying from various causes, and 11 cases subjected to surgery for symptoms of acute abdomen revealed a close association between diverticular disease and intestinal tuberculosis. Thus, among the 500 patients subjected to gastrointestinal X-ray (75% male, with an age range of 25-70 yr), 33% were negative, 33% had nonspecific functional or inflammatory changes, and 33% had specific pathological findings, including 114 cases of perivisceritis (66 of which were periduodenitis), 20 cases of calcified lymphoma, 11 of intestinal tuberculosis, and 18 of diverticulosis (9 duodenal and 9 of the colon). The 284 autopsies (229 males and 55 females) revealed 6 males and 1 female with intestinal diverticula (2 duodenal and 5 of the colon); 4 of these 7 patients were obese, and 5 had intestinal tuberculosis. Finally, positive tests for tuberculosis were obtained in 3 of 5 patients subjected to radical surgery and 2 of 6 patients given palliative operations, 10 of the 11 cases being men. Diverticular disease seems to be observed more frequently, and at a younger age, among patients with tuberculosis than in the general population. This is ascribed either to specific tuberculosis of the intestine or to some nonspecific abdominal pathology, closely associated with tuberculosis, which favors the development of diverticula.

3323 **XYLAMIDE (MILID) IN THE TREATMENT OF GASTRODUODENITIS ASSOCIATED WITH LEAD POISONING.** *(It.)* Gambini, G. (Luigi Devoto Clin., U. Milan, Italy) and R. Grisler. *Minerva Med* 60(23):1017-1023, 1969.

Nine patients (30-58 yr old) with occupational lead poisoning and radiologically confirmed gastroduodenitis, who presented with symptoms of gastralgia, gastric pyrosis, vomiting, acid regurgitation and dyspepsia, were treated with xylamide (2 g/day i.m., i.v. and/or p.o.) and $CaNa_2$-EDTA for 15 days; the response to treatment was compared with that in 4 controls treated only with $CaNa_2$-EDTA, who showed no change in gastrointestinal symptoms and no decrease in gastric secretion. As a result of xylamide therapy, complete remissions were obtained in 6 of the 9 patients and marked improvement in the other 3; the basal and histamine-stimulated gastric secretion decreased in both volume (by 33.0-34.7%) and acidity. There vere no side effects. The favorable effects of xylamide in these atients are attributed to both the antisecretory and the antipasmodic effects of this drug.

324 SYSTEMIC EFFECTS OF INTESTINAL REVASCULARIZATION. *(E.)* Bergan, J. J. Northwestern U. Med. Sch., Chicago, Ill.), S. P. Haid and J. onn Jr. *Amer J Surg* 117(2):235-241, 1969.

evascularization procedures for acute splanchnic ischemia vere performed in 13 patients (10 men and 3 women, 37-76 r old), 6 of whom survived the postoperative period. The roup included 8 embolectomies of the splanchnic vessels with successful revascularizations and 6 survivors. Two of 3 cases f thrombosis were revascularized, but died anyway, while either of the 2 patients with nonorganic occlusions had sucessful procedures. The 2 sudden deaths following successful evascularization were due to cardiac and hepatic failure, resp. o cases of severe acidosis, massive hyperkalemia, or absorption f toxic intestinal contents were noted.

325 MORTALITY IN EXPLORATORY LAPAROTOMY. *(E.)* Fock, G. (U. Cent. Hosp., Helsinki, Finland) nd K. Kospipuro. *Ann Chir Gynaec Fenn* 56(2):266-269, 967.

etween 1955 and 1964 a total of 34,224 patients were treated a surgical department: 634 died. The annual mortality rate as 1.8% on average (range 1.6-2.2%) during the period studied. aparotomies (1316) were performed for diagnostic purposes: parotomy being defined as exploration of the abdominal avity, including biopsy or other procedures (e.g., prophylactic ppendectomy). Deaths occurring within 7 days after operaon were considered operative deaths. Of the laparotomies, 17 were performed on women, and 16 (2%) died. In 9 of ese, surgery revealed mesenteric thrombosis or embolia; in , the planned palliative procedure for cancer could not be perormed and the patient died. One patient committed suicide by rinking concentrated sulfuric acid. Of the 498 men undergoing rgery 17 (3.4%) died. Laparotomy in this group revealed inperable vascular disease in 8, extensive carcinoma in 4, hemorlagic pancreatitis in 3, and renal insufficiency in 1. One paent died of methyl alcohol intoxication. Only 3 deaths ocrred in women under 50 yr of age, although 75% of the ries were women under 50. Only 4 deaths occurred in men nder 50 yr of age. The total mortality rate was 2.6%. Vasular disease was the commonest cause of death: 52% of the atients were suffering from some vascular disease. Carcinoma ccounted for 30%, pancreatitis, 9% and intoxication, 6%. If eaths resulting from mesenteric thrombosis and carcinoma e excluded, the mortality rate is 0.47%. If natural causes of eath, carcinomata, mesenteric thrombosis and intoxications e excluded the mortality is 0.3%. Because mortality is very w, the clinician is justified in suggesting exploratory laparomy to elucidate the diagnosis in uncertain cases.

326 SOME OBSERVATIONS ON ELIMINATION OF SABIN'S VACCINE VIRUS FROM THE TESTINE OF VACCINATED CHILDREN AND FREUENCY OF INFECTIOUSNESS TO RELATIVES. *(It.)* uberto, M. (Inst. Hyg., U. Padua, Italy) and C. Piccoli. *Gior en Sci Med* 23(5-6):45-52, 1968.

Among 58 subjects of 15 families of a good hygienic level, 22 children were vaccinated with Sabin's oral poliomyelitis vaccine. Before administration enteric viruses were present in fecal samples in 9% of the children, and in 14% of their relatives. After vaccination the percentage of elimination of attenuated virus was, in chilldren and in relatives resp.: for virus type 1, 9% and 47%; for virus type 2, 90% and 47%, for virus type 3, 72% and 22%. The period of elimination in children was almost the same for the 3 types of virus: 1 week in 35%; 2 weeks in 40%, 3 weeks in 20%. In relatives the percentage of elimination, during the first, second and third week resp., was: virus type 1, 76%, 11% and 11%; virus type 2, 47%, 47% and 6%; virus type 3, 25%, 75% and 0%. On the basis of these data the distinct possibility of infection among relatives during vaccination has been documented.

3327 OBSERVATIONS ON THE MECHANISM OF ABDOMINAL PAIN. *(E.)* Holdstock, D. J. (Cent. Middlesex Hosp., London, England), J. J. Misiewicz and S. L. Waller. *Gut* 10(1):19-31, 1969.

Intraluminal pressures were measured in the small or large intestine of 9 patients (6 men and 3 women) suffering from recurrent attacks of severe abdominal pain, for which no cause could be found after extensive investigation. Three patients had had previous surgical procedures. Of these, 2 postgastrectomy patients had intermittent and mild symptoms of dumping but these were absent during the manometric studies. Seven patients developed typical attacks of abdominal pain during the manometric studies and in every case the symptoms coincided with striking alterations in the records of intraluminal pressure. Such alterations occurred in all patients and were often the only positive finding on investigation. Pain coincided with small intestine pressure activity in one of the patients with the postgastrectomy syndrome and in a patient who had had a subtotal colectomy. The other postgastrectomy patient had upper and lower abdominal pain and changes in both small and large intestine motor activity were observed in him. In one of the postgastrectomy patients, i.v. serotonin produced pain. In 5 patients, the onset of abdomen pain coincided with a marked increase in colon motor activity after a meal or an injection of prostigmine. Two further patients showed similar changes in colonic pressure but remained symptom-free. Of these 7 patients, 5 had irritable bowel syndrome, while the other 2 suffered from the post-dysenteric bowel syndrome and the postgastrectomy syndrome, resp.

3328 REASSESSMENT OF MASSIVE UPPER GASTROINTESTINAL HEMORRHAGE ON THE WARDS OF THE BOSTON CITY HOSPITAL. *(E.)* Amir-Ahmadi, H. (Harvard Med. Sch., Boston, Mass.), R. S. McCray, F. Martin, W. Mitch, P. A. Kantrowitz and N. Zamcheck. *Surg Clin N Amer* 49(3):715-726, 1969.

A review of the records of 144 consecutive patients admitted with the diagnosis of upper gastrointestinal hemorrhage during the 12 months starting July 1, 1965 showed that the most frequent diagnosis, hemorrhagic gastritis, was confirmed at endoscopy or autopsy in 24.3% of the series and suspected on clinical grounds in 13.2% more. The mortality rate for the entire group was 12.5%; it was approximately twice as great in the 47 patients without a confirmed diagnosis of the bleeding site as it was in the 97 patients in whom diagnosis was clearly established. The decreased mortality as compared to that in 1955 (25.4%) may be related to the smaller percentage of "severe" bleeders and to improved management resulting from more accurate diagnosis and reduced need for surgery. The increased used of emergency endoscopy is the major advance in the management of patients with upper gastrointestinal hemorrhage.

3329 **PERITONEAL SYNDROME IN RHEUMATIC FEVER.** *(Rus.)* Korzon, I. K. *Vestn Khir Grekov* 102(1):143-144, 1969.

3330 **EXPERIMENTAL CONTRIBUTIONS OF THE PROPHYLAXIS OF ABDOMINAL ADHESIONS WITH TRASYLOL.** *(Por.)* Grundmann, E. *Rev Brasil Med* 25(10):701-702, 1968.

3331 **CHANGES IN THE FLUORESCENT ANTIBODY TITER IN 58 CASES OF INTESTINAL OR URINARY SCHISTOSOMIASIS TREATED WITH NITROTHIAMIDAZOLE.** *(Fr.)* Coudert, J., P. Ambroise-Thomas, M. A. Pathier and T. Kien Truong. *Lyon Med* 219(12):1041-1046, 1968.

3332 ***SALMONELLA, SHIGELLA*** **AND ENTEROPATHOGENIC** ***ESCHERICHIA COLI*** **ISOLATIONS IN THE EAST AND WEST SEPIK DISTRICTS, TERRITORY OF PAPUA AND NEW GUINEA.** *(E.)* Morahan, R. J. (Commonwealth Serum Labs., Wewak, Australia). *Med J Aust* 2(10):438-440, 1968.

3333 **SERUM LEVELS OF IMMUNOGLOBULINS IN MARASMIC INFANTS.** *(E.)* Najjar, S. S. (Sch. Med., American U. Beirut, Lebanon), M. Stephan and R. Y. Asfour. *Arch Dis Child* 44(233):120-123, 1969.

3334 **TYPHOID FEVER IN AFRICAN AND INDIAN CHILDREN IN DURBAN.** *(E.)* Scragg, J. (Dept. Pediat., U. Natal, Durban, S. Africa), C. Rubidge and H. L. Wallace. *Arch Dis Child* 44(233):18-28, 1969.

3335 **SALIVARY DUCT AUTOANTIBODY IN SJOGREN'S SYNDROME: CORRELATION WITH FOCAL SIALADENITIS IN THE LABIAL MUCOSA.** *(E.)* Whaley, K. (Western Infirm., Glasgow Scotland), D. M. Chisholm, R. B. Goudie, W. W. Downie, W. C. Dick, J. A. Boyle and J. Williamson. *Clin Exp Immun* 4(3):273-282, 1969.

3336 **PENETRATING INTRA-ABDOMINAL INJURY CAUSED BY HIGH-PRESSURE WATER JET.** *(E.)* Neill, R. W. K. (Park Hosp., Manchester Royal Inf., Manchester, England) and B. George. *Brit Med J* 2(5653):357-358, 1969.

3337 **TYPHOID FEVER AND PREGNANCY.** *(It.)* Ferlazzo, B. (Clin. Infect. Dis., U. Messina, Italy) and G. Russo. *Policlinico Prat* 75(51):1706-1711, 1968.

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3340 **TYPHOID FEVER.** *(Fr.)* Frottier, J. *Cah Coll Med Hop Paris* 10(2):77-92, 1969.

3341 **THE EVOLUTION OF INTESTINAL PARASITIC DISEASES DUE TO WORMS IN MINERS.** *(Fr.)* Bassleer, J. *Rev Med Liege* 24(6):249-257, 1969.

3342 **THE PREVALENCE OF INTESTINAL HELMINTHIASIS IN THE CITY OF ATIQUIZAYA.** *(Sp.)* Navarro M., J. E. (Fac. Med., U. El Salvador, San Salvador). *Arch Col Med El Salvador* 21(4):267-280, 1968.

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3347 **SPIGELIAN HERNIA.** *(Rus.)* Goldin, V. A. (Hosp. Surg. Clin., P. Lumumba People's Friendsh U., Moscow, USSR). *Khirurgiia (Moskva)* 45(1):62-65, 1969.

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03076* 03346 03435
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03084*
IN CHILDREN,LIVER
02838 03158* 03164* 03178
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03043* 03054 03057 03132*
IN CHILDREN,PANCREAS
03130*
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03405
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02627* 02763* 02961* 02963* 02979 03319* 03344
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02818 02946
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03334 03340 03422
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03117*
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03245
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03208 03269 03271
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02797 03259*
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03270 03283*
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02709* 02797 02812 03178 03236* 03249 03259* 03261*
03273
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02694*
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02682* 02817 02817 02913*
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02812 03178 03235* 03236* 03249
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03177 03184
IN LARGE INTESTINE,FOREIGN BODIES
03107
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03207 03222
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03058
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02815 03044* 03048 03259* 03425
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03058
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03153
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02685

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03286*
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03254
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03010* 03034
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02790
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03110 03293 03401 03419
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02716 02826 03094 03128* 03312 03433
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02760* 02772 02779 02949
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02629* 02635 02662* 02668 02669* 02672* 02683* 02780
03002* 03135 03187 03274
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02980
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03057
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02645 02676*
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02798 02995 03070* 03319* 03346
ION TRANSPORT
02644 02646 02647 02667 02686 02688 02746 02912*
03362
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02643* 02649 02651 02689 03137 03208
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02663* 03161* 03209
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02643*
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02713 02714 02997 03155* 03324* 03409

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02751 02851 03126 03157* 03181 03209 03230 03231
03250 03255 03275 03278
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02757* 02802 02813 02832 02852 03158* 03177 03181
03207 03215 03217*
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03211
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03158* 03181 03194 03215
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03194 03195 03204
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03181 03184
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03195
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03055 03158* 03184
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03188 03189 03190 03215 03290* 03300
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03177 03184
JEJUNUM
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SEE ALSO SMALL INTESTINE
02640* 02649 02654* 02680* 02764* 02774 02881 02928
02970 02976 02985 02992 02994 03038 03050 03053
03123 03346 03416 03423 03425 03436

KIDNEY
02720 02757* 03223
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02657
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03425 03442

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02825
LACTOSE ABSORPTION
02820 02825 03057
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SEE ALSO COLITIS
SEE ALSO DIARRHEA
SEE ALSO DYSENTERY
SEE ALSO ENTEROCOLITIS
SEE ALSO ILEUS
SEE ALSO INTUSSUSCEPTION
SEE ALSO RECTUM
SEE ALSO SIGMOID
03062*
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02646 02647 02689 02809 02831 03048 03429
LARGE INTESTINE ANOMALIES
03086 03092
LARGE INTESTINE ATRESIA
03084*
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02657 03102
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03061* 03072* 03087 03089 03114 03413
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02656* 02742* 03353 03420
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03071*
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02853 02984 03078* 03086 03089 03092 03093 03094
03103 03109 03121 03125 03325* 03327*
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03060* 03089 03094 03097 03098 03103 03104 03110
03331 03341 03374 03403
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03081* 03082* 03090 03322* 03364
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03081* 03083*
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02983 03070* 03078* 03080* 03436
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02993 03069* 03103 03105
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03124
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03084*
LARGE INTESTINE INJURIES
02992 03070*
LARGE INTESTINE MICROORGANISMS
02739* 03059 03099 03111 03199 03349 03390 03429
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02646
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02656* 02657 03381 03429
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02646 02993 03067* 03094 03119* 03121 03127 03392
03429 03432
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03093 03104
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03094 03107
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03061* 03080* 03087 03114 03393 03413
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02959* 02975 02984 03070* 03073* 03076* 03092 03109
03141 03388 03413
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03069* 03094 03102 03105 03110 03121 03127
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03070* 03107 03219*
LARGE INTESTINE PERFUSION
02656*
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03093 03095 03104
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02853 02959* 03086 03089 03093 03103 03121 03125
LARGE INTESTINE SECRETION
02657
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02775 02975 02984 03037 03061* 03062* 03063* 03066
03070* 03076* 03078* 03079* 03080* 03081* 03082* 03083
03084* 03092 03094 03098 03100 03102 03105 03107
03110 03112 03114 03122 03126 03127 03315* 03338
03388 03392 03393 03393 03413 03436
LARGE INTESTINE TRANSPLANTATION
02876 03396
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02914 03098 03388 03424
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03097
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02959* 03064* 03070*
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03126 03201
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03062*
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03107
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02657 03060* 03069*
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03165*
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03373 03406
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02648 02726 02727 02747 02861 03022 03046 03049
03200 03397

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02648 02665 02666 02734 02747 02801 03049 03137
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02626* 02648 02698* 02705* 02707* 02724 02733 02747
02806 02807 03192 03397
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02623*
LIVER
SEE ALSO AMEBIASIS
SEE ALSO BILE
SEE ALSO BILIARY TRACT
SEE ALSO BLOOD COAGULATION
SEE ALSO CHOLESTASIS
SEE ALSO CIRRHOSIS
SEE ALSO GLYCOGEN STORAGE DISEASE
SEE ALSO HEMOSIDEROSIS
SEE ALSO HEPATITIS
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02828 03264*
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03028 03113 03179 03201 03216 03220*
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03261*
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02720 02827 03213
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02630 02819 02821 02848 03175
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03196
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02618* 02624* 02635 02639 02694* 02695* 02696* 02697*
02698* 02700* 02701* 02702* 02704* 02705* 02706* 02709*
02710* 02711 02712 02713 02714 02715 02718 02719
02720 02721 02722 02726 02727 02728 02732 02738*
02765* 02771 02827 02830 02838 03154* 03169* 03170*
03186 03187 03191 03194 03209 03210 03213 03222
03223 03224 03227 03273
LIVER BIOPSY
02712 02765* 02769* 02771 02799 02806 02807 02852
03156* 03177 03182 03183 03186 03204 03208 03217*
03220* 03230 03251 03273 03275 03281*
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02723 02729 02787 02904* 02921 03157* 03164* 03170*
03171* 03197 03198 03203 03214 03232*
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02702* 02705* 02706* 02718 02724 02733 03192
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02696* 02718 02723 02725
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02648 02666 02707* 02747 02807 03245
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03155* 03159* 03167* 03191 03196 03268 03283*
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02885 03199 03212 03228 03258*
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02697* 02788 02830 03183
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03164* 03175 03180 03352
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02757* 02765* 02770 02790 02799 02805 02806 02807
02809 02811 02819 02821 02829 02833 02834 02835
02836 02838 02842 02848 02850 02851 02852 02854
02968 03118* 03156* 03166* 03175 03178 03183 03214
03216 03217* 03220* 03225 03233* 03246
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SEE ALSO LIVER FUNCTION TESTS
02769* 02808 02812 02813 02814 02819 02829 03171*
LIVER DISEASE ETIOLOGY
03216
LIVER DISEASE TREATMENT
02630 03161* 03178 03184 03216 03220*
LIVER DISEASES
02622* 02665 02770 02787 02790 02827 02829 02836
02850 02851 02852 02885 03023 03028 03113 03126
03158* 03164* 03170* 03175 03176 03178 03180 03181
03183 03185 03194 03199 03200 03201 03203 03212
03213 03216 03225 03238* 03275 03277 03278 03279
03281* 03387
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02618* 02635 02639 02641* 02695* 02696* 02698* 02701*
02705* 02706* 02708* 02709* 02710* 02711 02713 02714
02715 02717 02718 02719 02722 02732 02738* 02765*
02771 02829 03166* 03169* 03182 03209 03223 03227
03246
LIVER FUNCTION TESTS
02622* 02641* 02665 02703* 02721 02757* 02793 02797
02799 02805 02829 02833 02834 02836 02844 03046
03156* 03158* 03166* 03169* 03171* 03172* 03186 03191
03207 03210 03218* 03233* 03235* 03237* 03251 03261*
03264* 03278 03283*
LIVER GLUCOSE METABOLISM
02713 02714
LIVER GLYCOGEN
02700* 02704* 02706* 02727
LIVER HISTOLOGY
02635 02696* 02718 02727 02729 02730 02732 02806
02811 02814 02852 03041* 03126 03161* 03167* 03186
03194 03204 03209 03224 03227 03230 03273 03278
03402
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02624* 02735 02793 02811 02812 03182 03246 03387
03399
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02838 03158* 03164* 03178
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02859 03155* 03162* 03191 03224 03226 03228 03229
03231
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03207 03222
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02699*
LIVER IRON METABOLISM
02663* 03161* 03209
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02626* 02648 02698* 02705* 02707* 02724 02733 02747
02806 02807 03192 03397
LIVER METABOLISM
02665 02698* 02700* 02704* 02705* 02706* 02707* 02708*
02711 02712 02713 02714 02719 02720 02721 02728
02834 03154* 03172* 03213 03235* 03237*
LIVER MICROORGANISMS
03126 03240*
LIVER MORPHOLOGY
02630 02631 03180 03186 03201 03222
LIVER NEOPLASMS
02634 02704* 02724 02729 02848 02851 03164* 03185
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02626* 02723 02725 02809 02852 02921 03171* 03197
03198 03203 03214 03402
LIVER NUCLEIC ACID METABOLISM
02713 02714 03273
LIVER PATHOLOGY
02622* 02630 02641* 02665 02699* 02704* 02765* 02827
02834 02852 03160* 03170* 03176 03180 03183 03184
03185 03191 03192 03193 03194 03201 03208 03216
03224 03225 03232* 03238* 03246 03247 03249 03278
03286*
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02708* 02719 02721 02735 03155*
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02626* 02707*
LIVER PLASMA PROTEINS
02639 02721
LIVER PROTEIN METABOLISM
02694* 02697* 02717 02721 03137 03249
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SEE ALSO LIVER DIAGNOSIS
02630 02799 02809 02821 02835 02848 02854 03175
03216
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02730
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02735 03227
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02834
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02808 02813 02814 02829 02838 02842 02851 03131*
03186 03214 03215 03218* 03222 03233* 03237* 03246
03411
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02630 02727 03160* 03162* 03163* 03164* 03169* 03173
03174 03175 03197 03203 03216 03226 03229 03352
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03155* 03162* 03167* 03182 03212
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03160* 03164* 03229
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03160* 03181 03229
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02618* 02639 02694* 02717 02718 02726 02728 02729
02852 03126 03167* 03185 03186 03187 03194 03204
03222 03227
LIVER,AGE EFFECTS ON
03195
LIVER,ALCOHOL EFFECTS ON
02700* 02719 02811 03218* 03221* 03260* 03271
LIVER,AMEBIASIS EFFECTS ON
03201 03216 03220*
LIVER,DISEASES ASSOCIATED WITH
03126 03199 03202 03216 03254
LIVER,DRUG EFFECTS ON
02699* 02700* 02701* 02706* 03157* 03182 03211

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03182 03199 03237*
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02709* 02806 02807 02812 02814 03187 03192
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02695* 03237*
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02722
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02710* 02711 02714 02717 02719 02722 02734 02793
02805 03165* 03205 03207 03211 03215 03218* 03222
03223 03224 03227 03228 03230 03231 03246
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02811
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02972 02993
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02933 02940 03050
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02845
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02845 02954 03050
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02852 02972

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02825 02844 02906* 02985 03051 03442
MALABSORPTION DIAGNOSIS
02861 02906* 03040* 03044* 03200
MALABSORPTION DIAGNOSIS,BIOPSY IN
03058
MALABSORPTION DIAGNOSIS,D XYLOSE IN
02815 03044* 03048 03259* 03425
MALABSORPTION ETIOLOGY
03041* 03042* 03045* 03059 03200
MALABSORPTION IN CHILDREN
03043* 03054 03057 03132*
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02980 03043* 03048
MALABSORPTION TREATMENT,ANTIBIOTICS IN
03058
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03049
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03047
MALABSORPTION,BLIND LOOP-INDUCED SECONDARY
03043*
MALABSORPTION,DISEASES ASSOCIATED WITH
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02906*
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02980
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02763* 02810 03039* 03040* 03045* 03046 03050 03053
03054 03056 03057 03058 03059 03391
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03022 03041* 03405
MALIGNANT ANUS NEOPLASMS
03077*
MALIGNANT BILIARY TRACT NEOPLASMS
03291 03303 03310
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02804 02871* 02883 02890 02891 02896 02954
MALIGNANT GASTROINTESTINAL NEOPLASMS
02786 03371 03393
MALIGNANT LARGE INTESTINE NEOPLASMS
03061* 03080* 03087 03114 03393 03413
MALIGNANT LIVER NEOPLASMS
02626* 02723 02725 02809 02852 02921 03171* 03197
03198 03203 03214 03402
MALIGNANT PANCREAS NEOPLASMS
02758* 02921 03138
MALIGNANT RECTUM NEOPLASMS
03061*
MALIGNANT SMALL INTESTINE NEOPLASMS
02774 02957* 02968 02972 02982 03038 03121 03413
MALIGNANT STOMACH NEOPLASMS
02847 02896 02922 02933 02934 02935 02936 02937
02938 02939 02940 02941 02942 02943 02944 02945
02948 02950 02954 02955
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03151 03333 03408 03415 03425 03442
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02756* 02759* 02773 02774 02793 02803 02805 02820
02821 02834 02846 02956 03121 03180 03306 03433
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02798 02969 02971 02974 02978 02981 02989 02990
02991
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03100
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03148*
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02682*
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02682* 02713 02714 02723 02725 03235*
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02668 03053 03137 03259*
METABOLISM,ELECTROLYTE
02686 02796 03148* 03362 03377
METABOLISM,LIPID
02648 02665 02666 02734 02747 02801 03049 0313
METABOLISM,PROTEIN
02665 03042* 03386
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02787 02809 02852 02891 02900* 02903* 02921 0293
02936 02940 02941 02945 02950 02955 02968 0307
03087 03198 03203 03393
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03316* 03384
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02754 02755 02840 03359 03361 03367 03433
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02739* 03059 03099 03111 03199 03349 03390 0342
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02739* 02754
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02739*
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03057
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SEE TRACE ELEMENT AND MINERAL ABSORPTION
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02649 02651 02689 02788 02830 02942 02943 0304
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03415
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02760* 02761* 02816
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MOTILITY PRESSURE STUDIES
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SEE ALSO ESOPHAGUS MOTILITY
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02656* 02760* 02761* 02816 02912*
MOTILITY,BILIARY TRACT
02652* 02816 03284* 03292
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02652* 02653* 02659 02762* 02865*
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02655* 02658 03292
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02638 02759* 02761* 02875 02882
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02652* 02816
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02660 02755 02760* 03363 03365 03379
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PREFACE

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LANGUAGE ABBREVIATIONS

Afr.	Afrikaans	It.	Italian
Ar.	Arabic	Jap.	Japanese
Bul.	Bulgarian	Kor.	Korean
Ch.	Chinese	Latv.	Latvian
Cz.	Czech	Lith.	Lithuanian
Dan.	Danish	Nor.	Norwegian
Dut.	Dutch	Pol.	Polish
E.	English	Por.	Portuguese
Eston.	Estonian	Rum.	Rumanian
Fin.	Finnish	Rus.	Russian
Fl.	Flemish	Ser.	Serbo-Croatian
Fr.	French	Sl.	Slovak
Ger.	German	Sp.	Spanish
Gr.	Greek	Sw.	Swedish
Heb.	Hebrew	Th.	Thai
Hun.	Hungarian	Turk.	Turkish
Ic.	Icelandic	Uk.	Ukrainian
In.	Indonesian	Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone	mC, μC	milli-, microcurie(s)
ADP	adenosine diphosphate	mg	milligram(s)
AMP	adenosine monophosphate	min	minute(s)
ATP	adenosine triphosphate	ml	milliliter(s)
BSP	sulfobromophthalein	mm	millimeter(s)
C	degrees centigrade	MTD	maximum tolerated dose
cm	centimeter(s)	ng	nanogram (10^{-9})
CNS	central nervous system	pg	picogram (10^{-12})
cpm	counts per minute	p.o.	orally
DNA	deoxyribonucleic acid	ppm	parts per million
e.g.	for example	r	Roentgen
g	gram(s)	RBC	red blood cells (erythrocytes), red blood count
μg	microgram(s)		
hr	hour(s)	resp.	respectively
i.m.	intramuscular	Rev.	review (only in citations)
i.p.	intraperitoneal	RNA	ribonucleic acid
IU	international unit(s)	s.c.	subcutaneous
i.v.	intravenous	sec	second(s)
kg	kilogram(s)	SGOT	serum glutamic-oxalacetic transaminase
LD$_{50}$	median lethal dose(s)	SGPT	serum glutamic-pyruvic transaminase
LDH	lactic acid dehydrogenase	U	unit(s)
m	meter(s)	UV	ultraviolet
M	molar	WBC	white blood cells (leukocytes), white blood count
mEq	milliequivalent(s)		
mM	millimolar	yr	year(s)
μM	micromolar		

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

3443 **THREE-DIMENSIONAL STRUCTURE OF THE HUMAN SMALL INTESTINAL MUCOSA IN HEALTH AND DISEASE.** *(E.)* Loehry, C. A. (St. Thomas Hosp., London, England) and B. Creamer. *Gut* 10(1):6-12, 1969.

Human small intestinal mucosa were examined under the dissecting microscope after autolysis of epithelial cells, and histologically by serial horizontal cross sections of conventionally fixed specimens. The normal three-dimensional mucosal structure proved to be more complex than had been thought. It has a preponderance of crypts over villi, and small intervillous ridges running between the crypts and joining up onto the base of villi. As the mucosa becomes abnormal these intervillous ridges hypertrophy to a varying degree as the villi shorten, and are responsible for the mucosal patterns that are seen in disease states.

3444 **STUDIES OF THE IMMUNOCHEMICAL I SPECIFICITY OF SOME ANTIBODIES TO HUMAN GASTRIN.** *(E.)* McGuigan, J. E. (Washington U. Sch. Med., St. Louis, Mo.). *Gastroenterology* 56(3):429-438, 1969.

Antibodies to gastrin obtained from rabbits immunized with human gastrin I (residues 2 through 17)-bovine serum albumin conjugates were evaluated in respect to specificity using a variety of peptides. These antibodies to human gastrin I demonstrated a high degree of binding of gastrin molecules from several other mammalian species, particularly sheep and dogs. Limited antibody cross-reactivity was observed with porcine cholecystokinin-pancreozymin: the extent of cross-reactivity was of the same order as seen with pentagastrin which contains the carboxyl-terminal tetrapeptide amide of gastrin. Among antibodies evaluated in these studies there was minimal antibody specificity demonstrated exclusively for the 1-through 13-residue region of the gastrin molecule.

3445 **SMALL INTESTINAL HISTOCHEMICAL AND HISTOLOGICAL CHANGES IN ULCERATIVE COLITIS.** *(E.)* Jankey, N. (Gordon Hosp., London, England) and L. A. Price. *Gut* 10(4):267-269, 1969.

Histological comparison of small intestinal biopsies from 10 colitic and 7 noncolitic patients showed no abnormalities in the noncolitic group but partial villous atrophy and a convoluted mucosal pattern under the dissecting microscope in 4 of the colitics. No difference was found between the two groups for any of the enzymes (alkaline phosphatase, acid phosphatase, nonspecific esterase, succinic dehydrogenase and leucinaminopeptidase, glucose-6-phosphate dehydrogenase, and monoamine oxidase) studied. No evidence was found, therefore, of any small intestinal enzyme deficiency in ulcerative colitics. Enzyme deficiency is not likely to be a cause of the malabsorption observed in acute attacks of ulcerative colitis.

3446 **THE LOCALIZATION OF PROTEOLYTIC ACTIVITY IN RAT LIVER MITOCHONDRIA AND ITS RELATION TO MITOCHONDRIAL SWELLING AND AGING.** *(E.)* Alberti, K. G. M. M. (Dept. Biochem., U. Sheffield, England) and W. Bartley. *Biochem J* 111(5):763-776, 1969.

Rat (male Wistar) liver mitochondria, stored at 0C, 22C and 40C, steadily increased during a 72 hr period in water, total amino acid content and leakage of protein. These processes were accentuated at the higher temperatures. The intramitochondrial accumulation of amino acids which occurs and proteolysis of internal barriers may be related to the spontaneous swelling. Analysis of data indicated that amino acids are produced within mitochondria and that adsorption and uptake from the medium do not contribute significantly to amino acids in the pellet. Beta glycerophosphate, a lysosome protectant, increased amino acid production. Treatment with Triton X-100 and disruption by freezing and thawing showed that 56% of proteolytic activity was 'free' in whole mitochondria, whereas only 11% of acid phosphatase activity, a lysosomal enzyme, was 'free'. 'Light' mitochondria contained 30% more neutral proteolytic activity but 300% more acid phosphatase activity than 'heavy' mitochondria. Mitochondrial neutral proteolytic activity does not appear to reflect lysosomal content.

3447 **EFFECTS OF ETHANOL AND A FAT-FREE DIET ON HEPATIC MITOCHONDRIAL FRAGILITY AND FATTY ACID COMPOSITION.** *(E.)* French, S. W. (Harbor Gen. Hosp., Torrance, Calif.), A. Sheinbaum and R. J. Morin. *Proc Soc Exp Biol Med* 130(3): 781-783, 1969.

The effect of essential fatty acid deficiency and chronic ethanol ingestion on liver mitochondrial fragility and fatty acid composition was studied in 60 young male Charles River rats. Rats fed ethanol developed a significant increase in percentage maximum activity of succinic dehydrogenase. The fat-free diet partially reversed this effect. The essential fatty acid deficient diet partially protected the mitochondria from developing the increased fragility induced by chronic ethanol ingestion. The mitochondrial fragility induced by ethanol ingestion was not related to changes in the proportions of arachidonic acid or other mitochondrial acids. Chronic ethanol feeding partially prevented the changes in mitochondrial fatty acid composition induced by essential fatty acid deficiency.

3448 **PORTAL HYPERTENSION IN ACUTE EXPERIMENTAL VENO-OCCLUSIVE DISEASE OF THE LIVER IN RATS.** *(E.)* McLean, E. K. (Royal Free Hosp., London, England) and K. R. Hill. *Brit J Exp Path* 50(1):37-41, 1969.

Portal pressure was measured in adult male Wistar rats (100-400 g) 1-14 days after an i.p. LD_{50} (30 mg/kg) of dimethylnitrosamine (DMN). Centrilobular necrosis and a significant increase in portal pressure were found at 5 and 7 days after DMN, but veno-occlusive lesions were not observed until 7 days. Control observations on rats receiving carbon tetrachloride showed no change in portal pressure attributable to centrilobular necrosis. After 14 days the portal pressure in the DMN-treated rats returned to normal.

3449 **BILIARY OBSTRUCTION SECONDARY TO HEPATIC VASCULAR LIGATION IN FETAL SHEEP.** *(E.)* Pickett, L. K. (Yale U. Sch. Med., New Haven, Conn.) and H. C. Briggs. *J Pediat Surg* 4(1):95-101, 1969.

Eleven Dorset Delane lamb fetuses with fetal ages of 102 to 111 days were subjected to hepatic artery ligations. Three others had sham operations. Three of the ligation group and 1 sham procedure ewe aborted within 10 to 14 days. One of the ligation group ewes was accidentally killed 3 days after surgery. Two lambs with ligations and 2 sham procedure animals were born without jaundice and with normal liver function tests. Three of the lambs who were born jaundiced deteriorated rapidly until decompression was performed. All of these jaundiced animals had elevated bilirubin levels, about half of which was conjugated. Alkaline phosphatase and SGOT levels were not as consistently elevated. A significant elevation of SGOT followed decompression procedures. Autopsy in the jaundiced animals revealed an interruption in the common duct adjacent to the ligation ties. There was a large variation in the remaining blood supply to the liver as demonstrated by aortogram. A. large amount of inflammatory tissue was found in all the operated lambs. Cholestasis and bile duct proliferation were noted in the livers of all the jaundiced lambs.

3450 **HEPATIC REVASCULARIZATION. AN EXPERIMENTAL METHOD.** *(E.)* Goldsmith, H. S. (Sloan-Kettering Inst., New York, N. Y.), J. Castillo and E. J. Beattie Jr. *Arch Surg (Chicago)* 98(5):591-594, 1969.

Twelve healthy adult dogs (14 to 23 kg) of both sexes had their splenic artery mobilized and inserted into a tunnel in the right middle lobe of the liver. Ten similar dogs had their splenic vein inserted into a tunnel in the left middle lobe of the liver. Five of these dogs also had their portal vein constricted to produce portal hypertension. Four weeks later exploration revealed dense scarring about the arterial implantation of 4 dogs, patency (demonstrated by pulsation) in 8 and pulsatile flow on cross-section in all 12. The 5 dogs with portal hypertension in addition to splenic vein implantations had functioning vessels. The splenic veins not subjected to portal hypertension were all thrombosed. Fluorescein, Hypaque and angiographic studies were used to demonstrate effective perfusion by the implanted vessels. The technique of taking extrahepatic sources of blood and implanting them directly into the liver is awaiting clinical trial.

3451 **HEPATITIS ANTIGEN CORRELATION WITH DISEASE AND INFECTIVITY OF BLOOD-DONORS.** *(E.)* Gocke, D. J. (Columbia U. Coll. Physicians Surgeons, New York, N. Y.) and N. G. Kavey, *Lancet* 1(7605): 1055-1059, 1969.

A specific acute-phase antigen was demonstrated in the sera of patients with viral hepatitis. In addition, this antigen was found in some blood-donors and correlated with development of hepatitis in recipients of their blood. The antigen was detected with a two-dimensional immunodiffusion system, employing sera from patients who had received multiple transfusions as antisera. Sera from 77 patients with a clinical diagnosis of acute viral hepatitis were studied. Of 49 tested in the first 12 days after the onset of symptoms, 39 (80%) were positive. No difference in incidence of this factor in the infectious and serum forms of viral hepatitis could be detected. The presence of this hepatitis antigen correlated closely with the course of acute viral hepatitis. Peak titers were found before clinical hepatic injury reached a maximum, and the antigen disappeared before resolution of the illness. The antigen disappeared from 6 to 34 days after the onset of symptoms, wit an average of 18 to 19 days. This factor was not present in patients with other types of liver disease or in patients with various other conditions. Hepatitis antigen was found in 8 of 1726 apparently healthy blood-donors. Of the 8 recipients of blood from these donors, 2 died of their underlying diseas shortly after transfusion. Of the remaining 6, 4 developed a positive test for hepatitis antigen and 3 of these exhibited clinical evidence of hepatitis. The other 2 remained well at 2 and 4 months after transfusion. None of 30 recipients of 23 units of negative donor blood developed hepatitis after transfusion.

3452 **CELLULAR ANALYSIS OF LIVER CARCINOGENESIS. III. COMPARISON OF THE ULTR STRUCTURE OF HYPERPLASTIC LIVER NODULES AND HEPATOCELLULAR CARCINOMAS INDUCED IN RAT LIVER BY 2-FLUORENYLACETAMIDE.** *(E.)* Merkow, L. (U. Pittsburgh Sch. Med., Pa.), S. M. Epstein, E. Farber, M. Pardo and B. Bartus. *J Nat Cancer Inst* 43(1):33-63, 1969.

The ultrastructure of hyperplastic liver nodules and hepatocellular carcinomas induced in male Wistar rat (150-200 g) liv by 2-fluorenylacetamide (2-FAA) was studied and compared. Cells obtained from hepatocellular malignancies typically sho marked variation of their cytostructure. In contrast, a relati uniform cytological structure characterized hepatocytes withi hyperplastic liver nodules. The fine structure of malignant hepatoma cells was not significantly altered when the host animals were fasted for 24 hr before sacrifice, whereas the hy perplastic liver nodule cells displayed considerable difference ultrastructure after fasting. A number of similarities were observed between organelles within cells of hyperplastic liver nodules and malignant hepatomas. Both lesions had similar features including prominence of smooth endoplasmic reticul often in cluster formation, and a relative paucity of parallel-arrayed, rough endoplasmic reticulum. Annulate lamellae, re ported to be present in 2-FAA-induced hyperplastic liver nodules, were also readily detected in malignant hepatomas. The above alterations were not observed in liver adjacent to hyperplastic liver nodules. The hyperplastic liver nodule is composed of cells which differ significantly and reproducibly from those of normal liver or from overtly malignant hepatocellular carcinoma.

3453 **INTESTINAL DISACCHARIDASE ACTIVITY AFTER BILLROTH II RESECTION FOR PEP ULCER.** *(E.)* Gudmand-Hoyer, E. (Rigshospitalet, Copenha Denmark), S. Jarnum and H. Worning. *Gut* 10(6):451-453, 1969.

Disaccharide (lactose, maltose and sucrose) tolerance tests as well as concentrations of disaccharidases in multiple biopsies from the first 50 cm of the efferent loop were performed in 13 (7 male, 6 female) patients with a gastrojejunostomy foll ing subtotal gastrectomy. None of the patients presented sig of disaccharide intolerance. Concentrations of disaccharidase varied systematically in the efferent loop; the lowest concentrations were observed near the stoma. In the next 20 cm th concentration increased to remain constant in the rest of the intestine studied. In 6 patients concentrations of enzymes b low the lowest normal value were observed in biopsies near t stoma. The histological picture of the biopsies was normal, even in patients with low concentrations of enzymes. The presence of low concentrations of enzymes in the first 20 cm of the efferent loop is of no significance in the diagnosis of disaccharide malabsorption.

3454 POLYMERIC COLLAGEN ISOLATED FROM THE HUMAN INTESTINAL SUBMUCOSA.

(E.) Steven, F. S. (U. Manchester, England), D. S. Jackson, J. D. Schofield and J. B. L. Bard. *Gut* 10(6):484-487, 1969.

Treatment of human intestinal submucosa, obtained from small and large bowel at necropsy, with dilute acetic acid allowed the dispersal of polymeric collagen fibrils which were purified by salt precipitation. These fibrils were 97% pure collagen. Pretreatment of the tissue with crude bacterial α-amylase or EDTA resulted in the dispersion of pure polymeric collagen fibrils. Examination of submucosal polymeric collagen fibrils dispersed in 0.1 M acetic acid demonstrated the typical 640 Å striated fibrils as well as fibrils which were partially unravelled. The protofibrils which make up the fibril were seen to be organized in the form of a 'stocking' type of structure, with some evidence of superhelical organization.

3455 STUDIES ON THE PREVENTION AND CURE OF EXPERIMENTALLY INDUCED FUNCTIONAL AND MORPHOLOGICAL LIVER CHANGES. 2ND COMMUNICATION.

(E.) Neukomm, S. (Solco Basle Ltd., Switzerland) and M. Kiraly. *Arzneimittelforschung* 17(9):1135-1142, 1967.

Carbon tetrachloride (CCl_4) intoxication of the liver induced in 69 female CFN rats was treated with an "extralysate" of mammalian liver (SHE). During the poisoning stage SHE prevented the accumulation of saponifiable lipids, slowed down the decrease in serum albumin level, minimized variations in the BSP test, and significantly reduced fatty degeneration and fibrosis. During the reparation stage SHE completely and quickly restored serum beta$_1$ and beta$_2$ globulin levels accelerated return of the serum albumin level to normal, restored the morphology of the liver parenchyma to normal, and returned the relative weight of the liver to normal levels. The principal site of action of SHE seems to be the endoplasmic reticulum and the particles of ribonucleic acid that are involved in protein synthesis.

3456 EFFECT OF CORTISONE ON THE DEVELOPMENT OF LESIONS CAUSED BY RADIATION OF THE GASTRIC MUCOSA.

(Fr.) Melon, J. (Lab. Anat. Path., U. Liege, France), J. Haot and E. H. Betz. *Path Europ* 2(3):322-336, 1967.

Rabbits (2-3 kg body weight) with surgically exteriorized stomachs were given X-ray treatment at the juncture of the fundic and the antral zones. The extent of the destructive lesions observed in irradiated animals was dose-dependent. A dose of 2500 r produced superficial erosions of the gastric mucosa after 12 days which, by the 40th day, became true peptic ulcers. After 70 days a progressive sclerosis developed in the tissues around the ulcers; healing was slow and the ulcers were still apparent after 120 days. The effect of cortisone on these lesions was studied by observing the gross and microscopic changes after daily injections (5 mg/kg body weight) beginning on the 15th day after irradiation. The incidence of ulcers was not increased by cortisone, but their formation seemed to be accelerated; they could be detected as soon as 3 days after treatment. Cortisone inhibited the formation of sclerosis around the lesions.

3457 OBSERVATION ON ESOPHAGEAL INNERVATION IN MAMMALS.

(It.) Muti, R. (Inst. Norm. Human Anat., U. Turin, Italy). *Boll Soc Ital Biol Sper* 44(14):1156-1158, 1968.

Study of species with esophageal tunica muscularis with striated muscular fibers (Cavia cobaya, Epimys norvegicus and Felix domestica), using the Falk-Hillarp test for the demonstration of catecholamine in fluorescent microscopy, showed the presence of adrenergic fibers in Auerbach's plexus of the esophagus. In the 3 species, thin adrenergic fibers were present and not very abundant, but more evident at the ganglion level running between nerve cells and very simple pericellular networks, and interposed between the contractile elements of the tunica muscularis. No important quantitative differences were observed in the adrenergic fibers of Auerbach's plexus between striated and unstriated musculature.

3458 ANATOMIC SUITABILITY OF LEFT HEPATIC LOBE FOR TRANSPLANTATION.

(It.) Silvestri, E. (Inst. Surg. Anat., U. Bari, Italy) and L. Intini. *Fegato* 14(3):361-398, 1968.

An anatomic angiographic study was performed on 40 corpse livers to investigate the possibility of using a part of the organ for heterotopic transplantation. It has been demonstrated that the left lobe (segments II and III) has an independent ileal peduncle containing arterio-porto-biliary components and an independent single suprahepatic vein. The anatomic isolation of the lobe was performed by first preparing the left branch of the hepatic artery, the left branch of the portal vein, and the left hepatic duct; then by separating the left lobe from the remaining parenchyma.

3459 IMMUNOBIOLOGIC SEMEIOLOGY OF VIRAL HEPATITIS.

(It.) Rosano, V. (Inst. Med. Microbiol., U. Messina, Italy). *Clin Europ* 7(6):728-732, 1968.

In 32 cases of infectious hepatitis, clinically subdivided into extremely severe, severe, mild, and of uncertain diagnosis, the serum level of lysozyme and properdin were determined. When the properdin level (determined by the Pillemer method) was above 4 U/ml, and lysozyme (determined by Fogelson and Costa-De Vita methods) was above 2 µg/ml, the illness was always very benign. When properdin and lysozyme were not detectable, the illness was extremely serious and 2 patients died. On the basis of this data, the use of properdin and lysozyme as coadjuvants of viral hepatitis in therapy, has been proposed.

3460 INTESTINAL BLOOD FLOW AND DRUG ABSORPTION FROM THE RAT JEJUNUM.

(E.) Ochsenfahrt, H. (Pharmacol. Inst., U. Tubingen, Germany) and D. Winne. *Life Sci* 7(9):493-498, 1968.

Jejunal loops approximately 25 cm long were made in male Wistar rats (260 ± 23 g), ligated at both ends and perfused with isotonic buffered saline solution (pH 8 or 6) containing 0.5/µC/ml of ^{14}C-labeled antipyrine (specific activity 2.95

mC/mM) or salicylic acid (specific activity 15.5 mC/mM) at varying rates. Venous blood samples were subjected to liquid scintillation counting. Diminishing the intestinal blood flow by a factor of 9 reduced the absorption rate of antipyrine to about 30% of the maximal value, while the blood concentration increased by a factor of 3. The ratio of blood-to-gut concentration was between 0.06 and 0.18. With salicylic acid a decrease of blood flow diminished the absorption rate and increased the blood concentration as with antipyrine, but an increase of blood flow did not significantly influence the absorption rate. The ratio of blood-to-gut concentrations varied between 0.05 and 0.30. The absorption rate of ionized salicylic acid failed to increase when intestinal blood flow was increased from low to high values while the absorption rate of the undissociated lipophilic antipyrine was closely related to blood flow.

3461 **GASTRIC MUCOSA IN EXCESSIVE DRINKERS OF ALCOHOL. HISTOLOGICAL AND SECRETORY STUDY.** *(Sp.)* Medina, L. L. A. (Med. Sch., U. Chile, Valparaíso), O. H. Aste, M. A. Lucchini and R. L. Silver. *Rev Clin Esp* 110(3):245-248, 1968.

The effect of alcohol on the gastric mucosa was studied in 2 groups: 59 alcoholics (men aged 25-70 yr), and 31 (25 men and 6 women) healthy, nonsmokers and nonalcoholics. Of the alcoholics 28 had a normal mucosa, 16 had simple gastritis and 14 had atrophic gastritis. Of healthy subjects under 40 yr, 15 had a normal mucosa, 6 had simple gastritis, and 1 had atrophic gastritis; in healthy subjects over 40 yr, 5 had a normal mucosa, 2 had simple gastritis and none had atrophic gastritis. (Two are unaccounted for.) Comparative studies of the two groups indicated that alcoholism does not cause changes in the gastric mucosa.

3462 **STUDIES ON "GASTRIC SECRETORY INHIBITOR" AND "GASTRIC ATROPHY-PRODUCING FACTOR." PART I. ISOLATION OF GASTRIC SECRETORY INHIBITORS FROM HUMAN GASTRIC JUICE.** *(E.)* Moriga, M. (Fac. Med., Kyoto U., Japan). *Jap Arch Intern Med* 15(7):175-181, 1968.

Using a 2-step gel filtration technique, human gastric juice was separated into 8 fractions of gastric acid juice and anacid juice. The gastrone activities of these fractions were examined in 87 pylorus-ligated Wistar rats. Two fractions of the acid specimen and 1 fraction of the anacid specimen inhibited gastric secretion. Histochemical studies on Shay rat gastric mucosa revealed that succinic dehydrogenase and NAD diaphorase activities were decreased after the injection of these fractions.

3463 **STUDIES ON "GASTRIC SECRETORY INHIBITOR" AND "GASTRIC ATROPHY-PRODUCING FACTOR." PART II. CHARACTERIZATION OF GASTRIC SECRETORY INHIBITOR FROM HUMAN GASTRIC JUICE.** *(E.)* Moriga, M. (Fac. Med., Kyoto, U., Japan). *Jap Arch Intern Med* 15(7):183-193, 1968.

Using 2-step gel filtration technique, human gastric juice was separated into gastric acid juice and anacid juice. The gastrone was the fucomucin and the sialomucin type carbohydrate of slow electrophoretic mobility and a single schlieren peak of 8.0S in the ultracentrifuge. These inhibitors originate in the gastric mucosa, the jejunal mucosa, the salivary gland, and the pancreas. Urogastrone is an excretory product of gastrone or similar substances. Gastrone has an acid-binding capacity.

3464 **A STUDY OF THE GASTRIC MUCOSA IN ALCOHOLICS.** *(Sp.)* Aste, H. (Med. Dept., U. Chile, Valparaíso), L. A. Medina and A. Lucchini. *Rev Med Chile* 96(9):586-592, 1968.

The morphological and functional effects of excessive alcohol consumption on the gastric mucosa were studied in 125 patients from a group of 156 subjects (150 men and 6 women) of whom 31 were not alcoholics. Three groups were established: 1) 58 alcoholics without chronic liver disease; 2) 26 patients with chronic liver disease due to alcohol consumption; and 3) 41 alcoholics with peptic ulcers. One case of chronic atrophic gastritis and 8 cases of chronic common gastritis were found in the nonalcoholic group. In the first group of patients 14 (24%) had chronic atrophic gastritis and 16 (27%) had chronic common gastritis, thus indicating an incidence similar to the nonalcoholic group. In the second group half had a normal gastric mucosa and the other half had either atrophic gastritis (6) or chronic common gastritis (7). In the third group 4 patients had chronic atrophic gastritis and 12 had chronic common gastritis. Alcohol does not seem to have a definite effect on the morphology or secretion of the gastric mucosa.

3465 **MORPHOLOGICAL AND ENZYMO-CHEMICAL ASPECTS OF DUODENAL EXOCRINE SECRETION AFTER SOME TYPES OF PHARMACOLOGICAL STIMULATION.** *(It.)* Vezzadini, P. (2nd Inst. Spec. Med. Pathol., U. Bologna, Italy), N. Melchionda, T. Salomone and M. G. Marlettini. *G Clin Med* 49(7):716-733, 1968.

Sprague-Dawley rats, with ligation of the gastrointestinal tube at the pylorum level, the duodenojejunal junction and the bile duct, were given intracardiac injections of acetylcholine, serotonin and morphine. These agents reduced the content of the mucous cells of the duodenal mucosa, while atropine, sorbitol and HCl failed to produce significant changes. A study of the peptic and tryptic activities of duodenal juice demonstrated that these drugs do not cause any variation at that level. After administration of serotonin and sorbitol a 70% and 47% increase in peptic activity, and a 90% and 58% increase in tryptic activity, resp. were observed.

3466 **HISTOCHEMICAL AND MORPHOLOGIC CHANGES IN GASTRIC MUCOSA OF DOGS ON ULCEROGENIC REGIMEN.** *(E.)* Spicer, S. S. (Med. Coll. South Carolina, Charleston) and D. C. H. Sun. *Amer J Path* 56(1):129-141, 1969.

Four adult female mongrel dogs subjected to combined sham feeding and adrenocorticotropic hormone (ACTH) were examined for changes in the histology and carbohydrate histochemistry of the stomach. The combined stimulation was ulcerogenic in the canine gastric mucosa, inducing erosions of the superficial surface epithelium. Gastric erosions involved loss of superficial, and to a lesser extent of foveolar, surface epithelium. The floor of the erosion consisted of mucous neck glands, congested vessels, collagen, and infrequent leukocytes. Foci observed at the border of erosions and elsewhere in the gastric mucosa showed diminished staining for mucinous secretion in the most superficial but not the foveolar part of the surface epithelium. An abnormal, thick layer of mucus overlay

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these foci. Other epithelial changes included downward displacement of surface epithelial mucous cells; focal hyperplasia of enlarged and depressed, goblet-like cells in the surface epithelium; depletion of sulfated mucosaccharide in chief cells; and ballooning of some of the deeper and more distal parietal cells. Stromal changes included mucinous cells in the superficial portion of the stroma papillae; presence of mucopolysaccharide-rich, calcium-containing giant cells and cysts in the lamina propria; and granulation or depletion of the normally abundant stromal mast cells.

3467 THE INHIBITORY EFFECT OF 3-METHYLCHOLANTHRENE ON NUCLEOLAR ALTERATIONS INDUCED IN RAT LIVER CELLS BY 3′-METHYL-4-DIMETHYLAMINOAZOBENZENE. *(E.)* O'Hegarty, M. T. (Med. Sch., U. Coll., Dublin, Ireland) and J. W. Harman *Cancer Res* 29(3):521-528, 1969.

Thirty male Wistar rats (average weight of 134 g) were divided into five groups which were fed basal diets and varying concentrations of 3-Methylcholanthrene and 3′-Methyl-4-dimethylaminoazobenzene. The latter compound caused morphologic changes in the hepatic parenchymal cell nucleoli only. The basic alteration consisted of a separation and redistribution of nucleolar components. There was a consistent separation of the nucleolus from associated chromatin by an apparently structureless, electron translucent zone. Fed simultaneously with the azo dye, 3-Methylcholanthrene significantly protected against the morphologic changes.

3468 AUSTRALIA ANTIGEN DETECTED IN THE NUCLEI OF PATIENTS WITH VIRAL HEPATITIS BY THE FLUORESCENT ANTIBODY TECHNIQUE. *(E.)* Millman, I. (Inst. Cancer Res., Philadelphia, Pa.), V. Zavatone, B. J. S. Gerstley and B. S. Blumberg. *Nature* 222(5189):181-184, 1969.

The fluorescent antibody technique was used to localize the Australia (Au 1) antigen within or near the nuclei of hepatic cells obtained from 4 patients with some form of viral hepatitis and Au (1) in their serum. Five patients with neither known liver disease nor serum Au (1) failed to demonstrate the fluorescent hepatic intranuclear granules. No other tissue obtained from Au (1) positive individuals including sternal bone marrow, kidney, jejunum and mesenteric lymph nodes was positive for these fluorescent granules. The data support the association of Australia antigen with hepatitis. A specific means of diagnosing viral hepatitis using the "Au (1) fluorescent test" is being evaluated.

3469 *IN VITRO* LABELING AND AUTORADIOGRAPHIC IDENTIFICATION OF LIVER CELLS IN ACTIVE DNA SYNTHESIS. *(It.)* Fagiolo, U. (Istituto Superior Sanitá, Rome, Italy). *Epatologia* 14(3):229-235, 1968.

Liver fragments (1-2 mm^3) of 8 day-old Swiss mice were incubated at 37C in 95% O_2 and 5% CO_2 for 1-6 hr in Eagle's medium containing 5% calf serum. ^{3}H-thymidine (10C/ml) was added at a concentration of 8 μC/ml). Incubation in Hasting's Shaw-Stadie's, Elliot's, and Krebs Ringer's phosphate solution had less effect on thymidine incorporation. If the incubation time was more than 120 min, marked alterations of the liver cells, due to autolysis, were observed. The labeling index *in vitro,* for the first two hours, was the same as *in vivo* (12%), showing an active DNA synthesis.

3470 RECRUITMENT IN HUMAN BILE DUCT FORMATION. *(E.)* Elias, H. (Chicago Med. Sch., Ill.). *Acta Hepatosplen (Stuttgart)* 14(5):253-260, 1967.

3471 CHANGE IN ALCOHOL DEHYDROGENASE ISOENZYME PATTERN DURING DEVELOPMENT OF HUMAN LIVER. *(E.)* Pikkarainen, P. (State Alc. Monopoly, Helsinki, Finland) and N. C. R. Räinä. *Nature* 222(5193):563-564, 1969.

3472 GIANT CELL ADENOCARCINOMA OF THE ESOPHAGUS. REPORT OF A CASE. *(E.)* Tateishi, R., M. Okada, H. Taniguchi, S. Imaoka and T. Iwanaga. *Ann Rpt Center Adult Dis* 7(1):64-67, 1967.

3473 THE ROLE OF THE LIVER IN FIBRINOLYSIS. A STUDY OF HEPATIC VEIN BLOOD. *(E.)* Menon, I. S. (Royal Victoria Infirm., New Castle upon Tyne, England). *J Indian Med Ass* 49(10):474-477, 1967.

3474 A CONTRIBUTION TO THE PROBLEM OF BIOLOGICAL ACTIVITY OF THE INTRAHEPATIC PORTAL BED IN THE PIG. *(E.)* Kaman, J. (Dept. Anat., Vet. Fac., Brno, Czechoslovakia). *Acta Anat* 67(2):172-200, 1967.

3475 HISTOCHEMICAL STUDIES ON THIAMINE-PYROPHOSPHATASE LOCALIZATION IN THE ADULT, EMBRYONIC AND NEOPLASTIC LIVER CELLS USING LIGHT AND ELECTRON MICROSCOPY. *(E.)* Vorbrodt, A. (Dept. Tumor Biol., Inst. Oncol., Gliwice, Poland). *Acta Histochem* 28(2):204-214, 1967.

3476 STUDY OF ANTIBODY-CONTAINING CELLS IN THE WALL OF THE APPENDIX AND OTHER LYMPHOID FORMATIONS OF THE INTESTINE. *(Rus.)* Lebedev, K. A. (Inst. Biomed. Problems, Minist. Publ. Health, Moscow, USSR), N. V. Latsinik and S. V. Novikova. *Arkh Pat* 30(6):68-72, 1968.

3477 ULTRASTRUCTURE OF GALL BLADDER EPITHELIUM IN REGENERATION. *(E.)* Bader, G. (Rostock-Suedstadt Hosp., Germany). *Acta Hepatosplen (Stuttgart)* 15(1):25-29, 1968.

See also: 3503,3549,3585,3586,4105

3478 **THE ASSESSMENT OF FUNCTION OF THE ISOLATED PERFUSED PORCINE LIVER.** *(E.)* Abouna, G. M. (Royal Victoria Infirm., Newcastle upon Tyne, England), T. Ashcroft, C. Hull, A. Hodson, J. Kirkley and D. N. Walder. *Brit J Surg* 56(4):289-295, 1969.

A technique for the isolation and perfusion of white pig (60-80 pounds) liver uses a specially designed liver chamber to which intermittent positive pressure is applied. To study the changes in liver viability during perfusion as a function of time and to assess the value of a variety of liver function tests, 12 experiments were carried out in which the isolated liver was perfused via the hepatic artery and the portal vein with homologous blood for 8-10 hr. Good blood flow was maintained throughout, oxygen consumption and bilirubin production reached peaks after 2 hr and liver glycogen was broken down within the first 30 min of perfusion and again after 5 hr. BSP excretion into the bile was over 90% in the second hr of perfusion in 5 livers with high oxygen consumption (group A) and 4 with lower consumption levels (group B). In group A BSP retention was 18% in the sixth hr as compared to almost complete retention in group B. The pattern of bilirubin clearance was similar in the 2 groups. Group A was able to maintain a steady pyruvate/lactate ratio throughout while lactate levels rose after 2 hr of perfusion in group B. Group A eliminated 2.3 to 2.4 mg% galactose/min throughout the perfusion but in group B the clearance at 6 hr was one-third that at 2 hr. Ammonia was rapidly cleared by all the livers both early and late in the perfusion. Bile output and oxygen consumption are good indicators of total liver function and the clearance of lactate, the lactate/pyruvate ratio, and the clearance of galactose are sensitive indicators of liver-cell function. BSP and bilirubin clearance are good particularly when their biliary excretion is also measured. Ammonia clearance alone is of little value.

3479 **ABSORPTION OF SATURATED AND UNSATURATED FATTY ACIDS BY RAT JEJUNUM AND ILEUM.** *(E.)* Gallagher, N. D. (Dept. Med., U. Sydney, Australia) and M. R. Playoust. *Gastroenterology* 57(1):9-18, 1969.

The absorption of ^{14}C-labeled octanoic, myristic, palmitic, stearic, oleic and linoleic acids was studied *in vivo* in isolated loops of intestine from Sprague-Dawley rats. Fatty acids of shorter chain length, or unsaturated, were absorbed more efficiently than were long chain saturated fatty acids. All fatty acids were absorbed more rapidly from micellar solutions containing monoglyceride and bile salt than from solutions prepared with albumin. It was also found that albumin inhibited the absorption of micellar fatty acid. Absorption of albumin-complexed fatty acid was more efficient from the upper jejunum than from the distal ileum; this difference was observed in the presence or absence of bile salt. Micellar unsaturated fatty acids were equally well absorbed by both parts of the intestine, but micellar saturated fatty acids were poorly absorbed by the ileum unless taurcholate in a very high concentration was present initially. The instability of micellar solutions in the ileum, which is the site of active bile salt absorption, explains these observations.

3480 **ABSORPTION OF IRON FOLLOWING X-IRRADIATION OF THE EXTERIORIZED SMALL INTESTINE.** *(E.)* Donati, R. M. (Walter Reed Army Res. Inst., Washington, D. C.), A. R. Berman, H. R. Jervis, L. R. Stromberg and H. Sprinz. *Proc Soc Exp Biol Med* 130(3):822-827, 1969.

The intestinal absorption of radioiron was determined after X-irradiation of the exteriorized small intestine in female Wistar rats. The morphologic lesion resulting was discontinuous, with areas of intestinal radiation injury alternating with areas which were essentially intact or hypertrophic. There was an increase in radioiron absorption after irradiation which may have been due to augmented absorption in the parts of the small intestine which did not develop the morphologic characteristics of severe radiation injury.

3481 **QUANTIFICATION OF CHOLESTEROL ABSORPTION IN MAN BY FECAL ANALYSIS AFTER THE FEEDING OF A SINGLE-ISOTOPE LABELED MEAL.** *(E.)* Borgstrom, B. (Div. Physiol. Chem., U. Lund, Sweden). *J Lipid Res* 10(3):331-337, 1969.

The fecal excretion of ^{14}C-cholesterol-4- and ^{3}H-β-sitosterol-22,23 was studied in normal human subjects after ingestion of a single tagged meal. When 150 mg of β-sitosterol (in the butter of a standard breakfast) was eaten by 20 subjects the mean recovery of the isotope in the feces was 90%. When plant sterols (70% β-sitosterol, 30% campesterol) were combined with cholesterol and used as an internal standard to correct for losses of cholesterol during intestinal transit and analytical procedures, excretion of dietary cholesterol was found to be 60-80%. The amount fed over the range 150-1910 mg had no effect. If absorption of cholesterol is calculated from these figures, no saturation of the cholesterol absorption mechanism is indicated for the amounts of cholesterol fed. The reason for the differences between these findings and those reported with other procedures is not clear, but may be related to the acute administration of a single dose of cholesterol in this study.

3482 **INSULIN STIMULATED TRANSPORT OF 3-*O*-METHYL GLUCOSE ACROSS THE RAT JEJUNUM.** *(E.)* Dubois, R. S. (U. Colorado Med. Ctr., Denver) and C. C. Roy. *Proc Soc Exp Biol Med* 130(3):931-934, 1969.

Segments of upper jejunum (20 cm) with an intact circulation were removed from male Sprague-Dawley rats and perfused extracorporeally and the transport of 3-*O*-methyl-D-glucose studied. Intestinal preparations from alloxan-diabetes animals had a significantly higher percentage minute absorption of the substrate. Insulin failed to modify the transport rate in both the control and the alloxan-treated animals. However, insulin stimulation of transport was observed in experiments carried out in a group of rats where diabetes was induced by anti-insulin serum.

3483 **THE INTERACTION OF CHOLESTEROL ABSORPTION AND CHOLESTEROL SYNTHESIS IN MAN.** *(E.)* Grundy, S. M. (Rockefeller U., New York, N. Y.), E. H. Ahrens Jr. and J. Davignon. *J Lipid Res* 10(3):304-315, 1969.

The interaction of cholesterol absorption and synthesis was studied in 1 normal and 5 hypercholesteremic subjects after ingestion of varying amounts of dietary cholesterol. Feeding large amounts of cholesterol to the normocholesteremic patient caused an expansion of body pools by as much as 20 g before the amount of cholesterol re-excreted as fecal neutral steroids each day came into balance with the colesterol absorbed from the diet. There was no detectable decrease in total body synthesis of cholesterol nor any increase in conversion of cholesterol into bile acids. However, feedback control of cholesterol synthesis was demonstrable when large quantities of plant sterols were fed: in the hypercholesteremic patients studied, the absorption of both endogenous and exogenous cholesterol was then greatly reduced, and a compensatory increase in synthesis occurred. That feedback control by dietary cholesterol is relatively unimportant in man, may be because in the metabolic steady state, the absorption mechanism is essentially saturated by the large amounts of endogenous cholesterol available for reabsorption.

3484 **STUDIES ON THE ELIMINATION OF CATECHOLAMINE IN THE DOG'S LIVER *IN VIVO* AFTER THE ADMINISTRATION OF ADRENALINE AND NORADRENALINE.** *(E.)* Noritomi, S. (Nagasaki U. Sch. Med., Japan). *Acta Med Nagasaki* 13(1-2):94-112, 1968.

Under pentobarbital anesthesia, 47 mongrel dogs of both sexes (10-15 kg) received a mixture of 100 μg/kg each of adrenaline and noradrenaline i.v. and portal and hepatic vein concentrations were measured fluorimetrically at varying intervals. In intact dogs, the reduction of catecholamine in the liver 1 min after administration of adrenaline and noradrenaline was over 70.1% for adrenaline and 56.1% for noradrenaline. The content of catecholamines was markedly reduced at 3 min, and the reduction rate was less at 3 min than at 1. In carbon tetrachloride (CCl_4)- and chloroform ($CHCl_3$)- intoxicated dogs the reduction rate of catecholamine in the liver was lowered 10 to 30%. In dogs with common bile duct ligations and jaundice the reduction rate was between that of the intact and that of the intoxicated animals. Levels of SGOT and SGPT were inversely proportional to the reduction rate of catecholamines in the liver. Hepatic glucose release in intact dogs began 1 to 3 min after catecholamine infusion and peaked in 7 min while there was almost no glucose release in the CCl_4 and $CHCl_3$ dogs after catecholamine infusion. Glucose output in jaundiced dogs was less than that of the intact animals.

3485 **ACTIVE INTESTINAL ABSORPTION OF *L*-GLUCOSE.** *(E.)* Neale, R. J. (Dept. Physiol., U. Sheffield, England) and G. Wiseman. *Nature* 218(5140): 473-474, 1968.

The active intestinal absorption of *l*-glucose was investigated by using sacs (each about 9 cm long) of everted mid-small intestines from rats kept on a restricted diet (6-10 g food/day for 9 days). The animals' body weight had decreased on the diet from about 250 g to about 170 g. The small intestine was removed under 'Nembutal' anesthesia (0.15 ml i.p.), washed with bicarbonate-saline solution and equilibrated with 95% O_2 and 5% CO_2 in a Warburg both for 1 hr at 37C. Initial serosal (inner) volume of the sac was 0.8 ml and the initial mucosal (outer) volume was 20 ml. The initial serosal and mucosal fluids contained 8.33 mM (150 mg%) *l*-glucose; the gas phase and incubation period were as noted above. Initial serosal/mucosal *l*-glucose concentration ratio was 1.00. Intestines from the semistarved rats transferred *l*-glucose and water into the serosal fluid: the final concentration ratio was 1.32. The *l*-glucose moved against its concentration gradient and therefore, was actively absorbed. Distention of the sacs by increasing the initial serosal fluid volumes (from 0.8 ml to 2 ml) did not change the final *l*-glucose concentration ratio. In contrast, sacs from rats fed freely (20-25 g food/day) yielded a final *l*-glucose concentration ratio of 0.80. Great distention of the sacs from the intestines of normal rats (initial serosal fluid volumes increased from 0.8 ml to 2.3 ml) altered the final *l*-glucose concentration ratio slightly to 0.95. In experiments with the normal rat intestine the final *l*-glucose concentration in the serosal fluid was always well below the initial concentration; therefore, the difference in absorption of *l*-glucose observed for the normal-rat and semistarved-rat intestines were not caused by a net movement of water. Transport of *l*-glucose against its concentration gradient did not occur in the absence of oxygen, or in the presence of 8.33 mM (150 mg%) *d*-glucose, 10 mM *l*-histidine, or 10^{-6} M phlorhizin. Active absorption of *l*-glucose was reduced, but not abolished, by 10^{-8} mM phlorhizin. The behavior of *l*-glucose in the presence of *d*-glucose and low concentrations of phlorhizin suggests that its active absorption mechanism is similar to that of *d*-glucose. The current hypothesis that sugars require the *d*-pyranose ring structure for active absorption is no longer tenable.

3486 **EFFECT OF PANCREOZYMIN ON IRON ABSORPTION FROM THE DIGESTIVE TRACT.** *(Cz.)* Brodanova, M. (Fac. Med., Charles U., Prague, Czechoslovakia), V. Hoenig, V. Kordac, V. Brodan and E. Kuhn. *Cesk Gastroent Vyz* 22(7):438-442, 1968.

Seven patients with liver cirrhosis, confirmed by biopsy, and 9 controls were given 90 U pancreozymin i.v. after the oral administration of Ferronate C (22 mg divalent iron and 20 mg ascorbic acid) to investigate the effect of the hormone on iron absorption from the digestive tract. All subjects were given the iron compound alone and with pancreozymin. In patients with liver cirrhosis pancreozymin caused a statistically significant drop in iron absorption, but in healthy subjects it did not.

3487 **ABSORPTION AND INTESTINAL TRANSPORT OF ^{14}C-MENADIONE.** *(E.)* Mezick, J. A. (Coll. Med., Ohio State U., Columbus), R. K. Thomkins and D. G. Cornwall. *Life Sci* 7(3):153-158, 1968.

A mixture of labeled vitamin K_3 (^{14}C-menadione) and unlabeled menadione with a specific activity of 0.06 μC/mg was administered (1.2 μC in 1 ml corn oil) directly into the isolated duodenum of 250 g white male rats with and without portal vein ligations and with biliary flow exclusion. Using a closed jejunal loop in 6 mongrel dogs (17 kg average weight) a similar dose was instilled with the thoracic and bile ducts cannulated in 1 group of 3 and the hepatic lymph node efferents excluded in another group of 3. Radioactivity was found in the systemic blood of the control and bile exclusion groups within 15 min. The specific activity in portal and aortic blood was identical in these 2 groups. Portal/aorta ratio was 1.6 versus 2.5 in rats with portal vein ligations. Radioactivity was found in both portal and systemic dog blood after 15 min. The portal/aorta ratio was 1.4. Significant radioactivity was found in the thoracic duct lymph of both groups of dogs.

3488 **REGIONAL VARIATION OF PROPIONATE TRANSPORT IN RAT SMALL INTESTINE.** *(E.)* Jackson, M. J. (Dept. Physiol., Sheffield U., England). *Life Sci* 7(9):517-523, 1968.

Everted sacs of upper, middle and lower small intestine were obtained from male white rats and filled with and suspended in the bicarbonate saline of Krebs and Henseleit. Ten mEq/1 chloride were replaced with propionate. Without glucose, net transfer of fluid occurred from mucosal to serosal sides in all sacs but there was a net gain of propionate in only the upper and middle regions of the small intestine where the propionate concentration transferred to the serosal side was greater than the propionate concentration initially present in the saline. The sac from the lower portion of the small bowel contained a final serosal propionate concentration lower than the final mucosal concentration and, due to the diffusion of propionate into the sac wall from the serosal fluid, also lower than the initial propionate concentration. The addition of 28 mM glucose to the saline resulted in similar qualitative transfers but larger quantities of both fluid and propionate. These differences in propionate transport along the intestine can best be explained by concluding that the jejunal region is specifically adapted to propionate transport.

3489 **RETENTION AND STORAGE SITES OF RADIOACTIVE POLYVINYLPYRROLIDONE.** *(E.)* Hulme, B. (U. Birmingham, England), P. W. Dykes, I. Appleyard and D. W. Arkell. *J Nucl Med* 9(7):389-393, 1968.

The storage sites of ^{131}I- labeled polyvinylpyrrolidone (PVP) with different molecular weights were studied in different species including man. ^{131}I-PVP with a molecular weight of less than 45,000 was rapidly excreted by the kidney while higher-molecular weight material was selectively stored in the reticuloendothelial system; 4-6% of the administered dose was retained in the liver. Rats excreted a larger proportion of each PVP fraction than did man. The irradiation after the administration of 20 μC of ^{125}I- or ^{131}I- PVP was not hazardous.

3490 **EFFECT OF GASTRIC JUICE ON IRON ABSORPTION IN PATIENTS WITH GASTRIC ATROPHY.** *(E.)* Jacobs, A. (Welsh Natl. Sch. Med., Cardiff, Wales) and G. M. Owen. *Gut* 10(6):488-490, 1969.

^{59}Fe-labeled ferric citrate was administered to 16 patients with the histamine-fast achlorhydria of pernicious anemia. All the patients were fully treated for their disease and iron absorption was measured prior to and simultaneously with the administration of neutralized and unneutralized normal gastric juice. Both forms of gastric juice significantly increased iron absorption.

3491 **EXPERIMENTAL STUDIES OF THE EFFECT OF COBALT-60 IRRADIATION ON FAT ABSORPTION.** *(Jap.)* Doi, E. (Fac. Med., Kumamoto U., Japan). *Nippon Acta Radiol* 28(5):590-603, 1968.

The effect of simple fractionated doses of ^{60}Co to the rabbit abdomen on intestinal fat absorption was studied using ^{131}I-triolein. In two groups of 4 rabbits each receiving 200 r ^{60}Co daily to the upper or the lower abdomen, blood radioactivity did not decrease statistically significantly. After total doses of 4000 r, fecal radioactivity did not increase, but did increase to a statistically significant degree after total doses of 6000 r and 8000 r. Fat absorption was reduced after total doses of 6000 r and 8000 r. In the groups receiving 400 r ^{60}Co daily to the upper abdomen, fecal radioactivity increased significantly after total doses of 2000 r; whereas, similar total dose to the lower abdomen produced only a slight increase. After total doses of 4000 r or 6000 r to the lower abdomen the increase in fecal radioactivity was statistically significant. Fat absorption was reduced after total doses of 2000 r.

3492 ***IN VIVO* STUDIES ON THE INTESTINAL HYDROLYSIS OF STARCH DURING CHILDHOOD.** *(It.)* Auricchio, S. (Inst. Pediat., U. Naples, Italy), F. Ciccimarra, D. Della Pietra and L. Moauro. *Pediatria (Napoli)* 75(4):529-540, 1967.

3493 **INTESTINAL CALCIUM ABSORPTION IN THE LAYING FOWL AND ITS IMPORTANCE IN CALCIUM HOMEOSTASIS.** *(E.)* Hurwitz, S. (Volcani Inst. Agric. Res., Rehovot, Israel) and A. Bar. *Amer J Clin Nutr* 22(4):391-395, 1969.

3494 **THE INTESTINAL ABSORPTION OF CARDIAC GLYCOSIDES *IN VITRO* AND *IN VIVO*.** *(Ger.)* Forth, W. (Inst. Pharm. Toxicol., U. Saar, Homburg, Germany), E. Furukawa and W. Rummel. *Naunyn Schmiedeberg Arch Pharm Exp Path* 262(1):53-72, 1969.

3495 **EVALUATION OF THE INTESTINAL ABSORPTION OF XYLOSE AND CAROTENE AFTER GASTRECTOMY.** *(Pol.)* Strat, C. (Med.-Pharm. Inst., Jassy, Romania), N. Popesco and E. Popesco. *Przegl Lek* 23(11):773-777, 1967.

See also: 3460,3498,3532,3927

MOTILITY

3496 **THE EFFECT OF METOCLOPRAMIDE ON GASTROINTESTINAL ELECTROMYOGRAMS IN NORMAL AND VAGOTOMIZED DOGS.** *(Sp.)* Naveiro, J. J. (J. Ramos Munic. Hosp., Buenos Aires, Argentina), C. A. Linares and C. J. Morel. *Prensa Med Argent* 55(39):1870-1872, 1968.

A gastrointestinal electromyograph with antral, prepyloric, duodenal and jejunal electrodes was employed in the study of 10 anesthetized dogs (9-18 kg body weight) and the effect of metoclopramide (2 mg/kg of body weight i.v.) recorded. The average frequencies and regularity of the base line were compared before and after vagotomy, and before and after metaclopramide. Metaclopramide did not significantly change the base line electrical rhythm in the stomach, duodenum or jejunum. A small increase in frequency was observed in the duodenum.

3497 **CHOLECYSTOKINETIC ACTIVITY OF THE NEW PEPTIDE CAERULEIN IN MAN.** *(E.)* Bertaccini, G. (Inst. Pharmacol., U. Parma, Italy), T. Braibanti and F. Uva. *Gastroenterology* 56(5):862-867, 1969.

Caerulein, an active decapeptide isolated from methanol extracts from frog skin, was tested in 42 normal individuals and in 10 cholecystopathic subjects for its cholecystokinetic activity. The threshold cholecystokinetic dose was 0.5-1.0 ng/kg. In healthy subjects, after administration of 5 or 10 ng/kg caerulein, a marked contraction was always obtained. The magnitude of the effect was satisfactorily dose dependent up to 20.0 ng/kg and lasted approximately 90 min and seemed to be accompanied by a spasmolytic effect on the sphincter of Oddi. Side effects were rare. Caerulein may be an alternate diagnostic agent to the usual fatty meal technique and it may also be used instead of cholecystokinin.

3498 **AN EFFECT OF INTESTINAL MOTILITY ON IRON ABSORPTION.** *(E.)* Schade, S. G. (Walter Reed Army Inst. Res., Washington, D. C.), B. F. Felsher and M. E. Conrad. *Proc Soc Exp Biol Med* 130(3): 757-761, 1969.

Iron absorption was studied in male albino rats given drugs that altered manifestations of the endotoxin response e.g., phenoxybenzamine hydrochloride (3 mg), endotoxin as *E. coli* lipopolysaccharide (0.1 mg), and atropine sulfate. A test dose contained 0.5 μC ^{59}Fe-citrate and 0.25 mg elemental iron as ferrous sulfate in 0.5 ml distilled water. The parenteral administration of either phenoxybenzamine or atropine sulfate to rats 1 hr before an oral test dose of radioiron markedly increased iron absorption in normal rats and in rats that had received *E. coli* endotoxin 12 hr before. There was a significant decrease in the serum iron concentration, an increased rate of ^{59}Fe clearance from the plasma and a delayed transit of ^{59}Fe through the intestinal tract of phenoxybenzamine treated animals. Atropine produced a similar effect. There was also a delayed transit of nonabsorbable ^{51}Cr-chloride through the gut of the phenoxybenzamine treated animals. Endotoxin treated animals had delayed iron absorption from isolated intestinal loops.

3499 **GASTROSCOPIC OBSERVATIONS OF THE DYNAMIC ANATOMY OF THE ANTRUM AND PYLORUS. [CASE REPORT]** *(E.)* Rider, J. A. (Franklin Hosp., San Francisco, Calif.), H. C. Moeller and E. J. Puletti. *Gastroint Endosc* 14(2):100-101, 1967.

3500 **THE PHYSIOLOGY OF THE ESOPHAGO-CARDIAL SEGMENT.** *(Fr.)* Monges, H. (Fac. Med., U. Marseille, France) and J. Salducci. *Actualites Hepatogastroent Hotel Dieu* 5(1):A2-A13, 1969.

See also: 3504,3695,3797

3501 SULFATED GLYCOPROTEINS IN HUMAN SALIVARY AND GASTRIC SECRETIONS.

(E.) Martin, F. (Edouard-Herriot Hosp., Lyon, France), R. Mathian, A. Berard and R. Lambert. *Digestion* 2(2):103-112, 1969.

Pure sulfated glycoproteins (SGP) have been isolated from human gastric secretions and saliva (collected from 28 patients) following proteolysis with pepsin and precipitation with cetylpyridinium chloride. The SGP are present only in low concentrations in parotid saliva and in much higher concentrations in submaxillary gland saliva. The chemical composition, as determined by gas liquid chromatography analysis of galactose, fucose, glucosamine, and galactosamine of the salivary and gastric SGP may be almost identical in the same patient. The important differences in the output and composition of SGP secreted by different individuals may be related to the ABO blood group and secretor systems or to some pathological co dition.

3502 THE EFFECT OF VASOPRESSIN ON THE EXCRETION OF ELECTROLYTES WITH THE SALIVA FROM THE DOG PAROTID GLAND.

(Rus.) Iaremenko, M. S. (A. A. Bogomolets Inst. Physiol., Acad. Sci Ukr. SSR, Kiev, USSR). *Fiziol Zh SSSR Sechenov* 55(2):20 212, 1969.

3503 STUDIES ON "GASTRIC INHIBITION FACTOR" AND "GASTRIC ATROPHY-PRODUCING FACTOR". PART III. INDUCTION OF GASTRIC ATROPHY IN DOGS AND GUINEA-PIGS BY INJECTION OF HOMOGENIZED GASTRIC MUCOSA. *(E.)* Moriga, M. (Dept. Intern. Med., Fac. Med., Kyoto U., Japan). *Jap Arch Intern Med* 15(8):255-268, 1968.

Of 13 healthy mongrel dogs (15 kg), 2 were injected with homogenates of homologous gastric mucosa and Freund's adjuvant, 3 with an autologous homogenate and adjuvant, 2 each with heterologous (human) gastric mucosa or gastric juice and adjuvant, 3 were kept as controls, and 1 provided homologous antigen. All except the autologous group received a second injection after 2 months. Twelve guinea pigs received homologous gastric homogenates unmodified and modified by varying acidification and/or dialysis. Gastric atrophy was present in all of the dogs receiving homogenates and was most marked in those receiving their own gastric mucosa. Atrophy was present as early as 2 months after the first immunization and persisted irreversibly for the 20 months of observation. Serum γ-globulin was elevated 3 months after the first immunization and then declined. Acidified and dialysed homogenates of guinea-pig gastric mucosa produced the most precipitating antibody and the only mucosal pathology.

3504 EFFECT OF GRADED DOSES OF PENTAGASTRIN, HISTAMINE AND 2-DEOXY-D-GLUCOSE ON GASTRIC SECRETION AND MOTILITY IN CONSCIOUS RATS. *(E.)* Konturek, S. J. (1st Dept. Med., Med. Sch., Krakow, Poland). *Scand J Gastroent* 3(6):572-576, 1968.

The simultaneous study of gastric secretion by means of a chronic gastric fistula and of gastric motility by the implantation of a small balloon in the rumen is described. The dose response curves to s.c. pentagastrin, histamine and 2-deoxy-D-glucose were obtained. There were no statistically significant differences between the maximal acid outputs for these stimulants. Pentagastrin administration caused a sudden inhibition of gastric motility, but histamine did not change the rate of contractions. Injection of 2-deoxy-D-glucose was followed by a slight increase in the frequency of gastric spontaneous contractions.

3505 CHLORHYDRIC AND PEPTIC SECRETION DURING INDUCED HYPER- AND HYPOCALCEMIA. STUDIES IN HYPO- AND HYPER-SECRETORY SUBJECTS. *(It.)* Rapino, P. (Inst. Clin. Med. Gen., U. Bologna, Italy), F. Tabarroni, D. Lo Bruno and A. D'Avena. *Riv Gastroent* 20(1):46-69, 1968.

The activity of gastric juice, pH, chlorhydria, and pepsin was studied, after infusion i.v. for 2 hr of calcium gluconate (15 mg Ca^{++}/kg body weight) in 12 hyposecreting subjects and of disodium edetate (Na_2 EDTA) (75 mg/kg body weight) in 15 hypersecreting subjects. Calcemia, phosphoremia and endogenous creatinine were determined in blood and urine. In 12 hyposecreting subjects Calcium administration induced an increase in volume of gastric juice in 8; an increase followed by a decrease in 3; and a decrease in 1. The pH of gastric juice increased for 90 min, and then decreased to 39.3% of the original value; the chlorhydria decreased and peptic activity increased to 63.2%. Calcemia reached a maximum of 14.2 mg%; there was an insignificant modification of phosphoremia. Opposite results were observed in hypersecreting subjects treated with Na_2 EDTA.

3506 GASTRIC SECRETION AFTER PARATHORMONE ADMINISTRATION IN NORMAL SUBJECTS. *(It.)* Ferlito, S. (Inst. Pathol. Spec. Med., U. Catania, Italy) and M. Calafato. *Riv Gastroent* 20(1):12-18, 1968.

Gastric secretion was studied in 15 normal subjects (all males, aged 22-56 yr), given 20 U Collip of parathyroid hormone (Parathormone). Histamine stimulation (1 mg i.m.) was also carried out in 4 of the subjects. The subjects were hyposecretory (3); normosecretory (10) and hypersecretory (2). In normosecreting subjects the average values, before and 2 hr after hormonal stimulation were resp.: gastric secretion 42 ml and 72 ml, with an increase of 86% ($P < 0.01$); pepsin units (Gross' test) 25 U and 50 U, with an increase of 100% ($P < 0.001$). The free and total acidity ratio (Topfer-Linnosier's test) increased 90%. The results in hypersecreting subjects were similar, with higher absolute values of HCl and pepsin. In hyposecretive subjects there was no significant change in secretion. No inhibitory phenomena were observed in the 4 subjects after histaminic stimulation.

3507 EFFECT OF INSULIN ON GASTRIC SECRETION, HISTAMINE FORMATION, AND ON THE INCIDENCE OF GASTRIC LESIONS. *(E.)* Kim, K. S. (George Washington U. Sch. Med., Washington, D. C.), P. T. Ridley and C. Tuegel. *Life Sci* 7(7):403-409, 1968.

Either 0.5 U/kg or 5.0 U/kg of crystalline insulin was administered i.p. to female Sprague-Dawley rats (170 to 240 g) with gastric fistulae. The lower dose of insulin resulted in a significant increase in total 4 hr gastric acid output while the larger one did not. Gastric mucosa homogenates collected after 4 hr showed histamine content (measured fluorometrically) significantly reduced by 5 U/kg of insulin but unchanged with the lower dose. The histamine forming capacity of the gastric mucosa was increased significantly by either dose, but more so with the higher. Chlorisondamine, a ganglionic blocking agent, given before insulin administration, blocked the histamine forming increase. The 5 U/kg dose of insulin produced a higher incidence of gastric lesions (7 of 12) than 0.5 U/kg (4 of 12) despite the fact that the measured gastric acid output was higher with the lower dose of insulin.

3508 HUMORAL MEDIATION OF THE INTESTINAL PHASE OF GASTRIC SECRETION AND OF ACID HYPERSECRETION ASSOCIATED WITH PORTACAVAL SHUNTS. *(E.)* Orloff, M. J. (Sci. Med., U. California, San Diego), H. Villar-Valdes, H. Rosen, A. G. Thompson and J. G. Thompson. *Surgery* 66(1):118-130, 1969.

Isolated, denervated fundic stomach pouches (Heidenhain) were constructed in 68 healthy adult mongrel dogs weighing 18 to 30 kg. In addition, in 26 dogs an antrectomy and gastroduodenostomy with a 12 cm long Roux-en-Y proximal jejunal fistula containing a metal cannula was constructed. In 18 animals an end-to-side portacaval shunt was made. The inferior vena cava and aorta of compatible animals was cross transfused and pouch acid and secretion measured. Cross transfusions between intact dogs with Heidenhain pouches did not demonstrate a significant difference in acid secretion compared to the base line. Cross transfusion between antrectomized donors with pouches and intact recipients with pouches while the donors were given an intestinal meal through their fistulae did not significantly stimulate acid secretion in either donor or recipient. Instillation of food into the intestine of an antrectomized dog with a portacaval shunt produced an 8-hr acid secretion peak of 428% above baseline in the donor and a 10-hr peak 244% above baseline in the intact recipient with a Heidenhain pouch. Cross transfusion without an intestinal meal in a group of similar animals had no stimulatory effect on either donors or recipients. ^{131}I-Human serum albumin (RISA) absorption from animals fed intestinal meals was the same for both the shunted and nonshunted, antrectomized animals.

3509 EFFECT OF SECRETIN AND CHOLECYSTOKININ ON THE RESPONSE OF THE GASTRIC FISTULA RAT TO PENTAGASTRIN. *(E.)* Tumpson, D. B. (VA Ctr., Los Angeles, Calif.) and L. R. Grossman. *Proc Soc Exp Biol Med* 131(1):186-188, 1969.

In 14 male Sprague-Dawley rats (weighing 325-528 g) with chronic gastric fistulas, secretin (75 U/kg) completely inhibited the gastric acid response to both maximal (62.5 μg/kg) and supramaximal (125 μg/kg) doses of pentagastrin. The effects of cholecystokinin (75 U/kg) on pentagastrin-stimulated (62.5 μg/kg) secretion were mixed. An early inhibitory phase was followed by a period of stimulation.

3510 EFFECT OF THE VAGUS NERVE AND SALICYLATE ADMINISTRATION ON THE PERMIABILITY CHARACTERISTICS OF THE RAT GASTRIC MUCOSAL BARRIER. *(E.)* Overholt, B. F. (Cornell Med. Ctr., New York, N. Y.), D. A. Brodie and B. J. Chase. *Gastroenterology* 56(4):651-658, 1969.

The effect of vagotomy and acetylsalicylic acid on the permeability characteristics and on damage of the gastric mucosal barrier was studied in male Holtzmann rats in 5 experimental situations with 8 rats in each group. Results indicated the following: 1) the vagus nerve has no direct effect on the maintainence of the permeability characteristics of the gastric mucosal barrier; 2) back diffusion of acid probably occurs normally in significant quantities; 3) vagal or other forms of secretory stimulation (bethanechol, 0.4 mg/kg; gastrin tetrapeptide, 8 and 16 mg/kg, or histamine, 8 mg/kg) can mask acid back diffusion by increasing acid output enough to exceed the amount diffusing into the mucosa; 4) aspirin damages the mucosal barrier of the vagotomized rat stomach as in the vagotomized canine stomach; 5) aspirin probably damages the vagally intact, secreting stomach without necessarily producing evidence of acid back diffusion; 6) large doses of parenteral aspirin damage the mucosal barrier.

3511 GASTRIN INHIBITION OF HISTAMINE-INDUCED GASTRIC SECRETION. *(E.)* Wilken, B. J. (U. Mississippi Med. Ctr., Jackson), C. F. Lowe, D. Hunt and J. D. Hardy. *Arch Surg (Chicago)* 98(5):647-651, 1969.

Eight mongrel dogs (15 to 25 g) of both sexes had Heidenhain pouches constructed and, after a period of recuperation, were subjected to a constant infusion of 0.15 mg histamine phosphate/kg/hr together with i.v. doses of gastrin pentapeptide (10 to 100 μg) at varying intervals. All 4 dose levels of gastrin pentapeptide produced a significant inhibition of histamine-induced gastric secretion, both in terms of volume and acidity, but there was no significant difference in the degree of inhibition produced by the various doses. Maximal inhibition occurred within 15 to 30 min of gastrin administration. Retching or vomiting occurred with even small doses of gastrin pentapeptide but the degree of inhibition did not correlate with these effects. No toxic effects were associated with histamine infusion.

3512 INTESTINAL RESECTION AND GASTRIC SECRETION IN DOGS WITH ANTRECTOMY. *(E.)* Landor, J. H. (U. Missouri Sch. Med., Columbia). *Arch Surg (Chicago)* 98(5):645-646, 1969.

Eight mongrel dogs (12.2 to 18.4 kg) of both sexes had antrectomies and Heidenhain pouches constructed along with gastroduodenostomies. Secretory collections were made from the pouches after a recuperative period. Four of the dogs then had resections of the entire mid-portion of the small intestine while the others had simple division of the jejunum with reanastomosis. Some increase in acid secretion was noted in the sham procedure animals, but there was a considerably greater increase in the dogs which were subjected to enterectomy.

3513 PENTAGASTRIN AND ACETYLCHOLINE RELATION TO HISTAMINE IN H+ SECRETION BY GASTRIC MUCOSA. *(E.)* Kasbekar, D. K. (Dept. Physiol., U. California, Berkeley), H. A. Ridley and J. G. Forte. *Amer J Physiol* 216(4):961-967, 1969.

Isolated resting frog gastric mucosa could be stimulated to secrete acid by pentagastrin or acetylcholine. After repeated stimulation, the mucosa became refractory to these secretagogues, but not to histamine. When the mucosa were equilibrated with radioactive histamine for a period of time and subsequently bathed in histamine-free media, the characteristic efflux of the label from the tissue could be separated into 3 exponentials. The time constant for the slowest efflux component corresponded to that for the decline in acid secretory rate, which is comprised of a single exponential. The time constants for efflux were not altered when a tracer dose of labeled histamine, which does not evoke acid secretion, was used. Under these conditions if acid secretion was stimulated with pentagastrin or acetylcholine the kinetics of the slowest efflux component are altered, indicating a mobilization of endogenous histamine. Histamine may be the final common mediator of acid secretion and pentagastrin and acetylcholine may act by a local mobilization of endogenous mucosal histamine.

3514 GASTRIC SECRETAGOGUES FOLLOWING PORTACAVAL SHUNTING. *(E.)* Griffen, W. O. (U. Kentucky Coll. Med., Lexington), M. Z. Slesh and C. S. Mooney. *Surgery* 66(1):111-117, 1969.

Seven mongrel dogs, 4 with denervated (Heidenhain) pouches, had peripheral blood amino acid, ammonia, histamine, and gastric pouch output measured hourly for 5 hr after a standard meal. These tests were done before and after an end-to-side portacaval shunt. In the first 3 hr gastric output was 171, 147, and 178%, resp., higher than controls. The hypersecretion persisted for the 5 hr after eating, but at a slightly reduced level. The differences at 2 and 3 hr were statistically significant ($p < 0.01$). Blood ammonia levels increased rapidly and at 2 and 3 hr were 202 and 260% above controls, resp. All blood ammonia levels were significantly different from control values. Blood amino acid levels showed an early rise: 13 and 34% above control values at the first and second hr with the peak at 2 hr. Histamine in the peripheral blood showed a slight increase at 3, 4, and 5 hr after the meal, but the values were not statistically significant. Ammonia may be a specific gastric secretagogue under these conditions.

3515 MEASUREMENT OF SULFATED AND NONSULFATED GLYCOPROTEINS IN HUMAN GASTRIC JUICE UNDER FASTING CONDITIONS AND FOLLOWING STIMULATION WITH HISTAMINE, PENTAGASTRIN AND INSULIN.

(E.) Glass, G. B. J. (Gastroent. Res. Lab., New York Med. Coll., N. Y.), H. Mori and T. Pamer. *Digestion* 2(2):124-143, 1969.

Fasting overnight residues collected from the stomach of 20 individuals with or without gastric disease, gastric juices from 4 individuals after histamine and pentagastrin stimulation, and from 18 after insulin stimulation were used for comprehensive quantitation of mucosubstances. Chondroitin sulfate A and sulfated glycoproteins were measured by a modification of the turbidimetric method of De Graef and Glass. The nonsulfated glycoproteins (including the sialomucins and blood group substances types) were measured either by the fucose assay of the papain digested gastric juice or mucus, with a correction for fucose content of sulfated glycoproteins; or by the recently developed turbidimetric method. This method compares turbidity of the cetylpyridinium supernatant of the papain digested gastric juice or mucus after addition of buffered ethanol with the turbidity of the gastric nonsulfated glycoprotein standard under similar conditions. Chondroitin sulfate A and C were absent or present only in trace amounts in gastric secretion of man. Sulfated glycoproteins were present at a relatively high concentration in gastric mucus and fasting gastric residual content, but at a low concentration in the basal secretion and after histamine, pentagastrin and insulin stimulation. Nonsulfated glycoproteins form the bulk of gastric glycoproteins in man, both in mucus and gastric juice. Histamine and pentagastrin decrease the concentration and to some extent also the output of sulfated and nonsulfated glycoproteins in gastric juice. Insulin causes variable responses, with a rise in the concentration and output of glycoproteins in some of the subjects and a slight decrease in concentration and unchanged output in the others.

3516 PHYSIOLOGY OF THE SECRETION OF ACID, PEPSIN, SULFATED POLYSACCHARIDES AND GLYCOPROTEINS BY THE DOG FUNDIC MUCOSA.

(E.) Ley, R. (Dept. Surg., Free U. Brussels, Belgium), J. Bremen, S. Verbeustel, M. C. Woussen-Colle and J. De Graef. *Digestion* 2(2):113-123, 1969.

The secretion of acid, pepsin, chondroitin sulfate and glycoproteins from mucus have been studied in 4 Heidenhain pouch dogs, under basal condition and during stimulation with histamine, a pentagastrin and a cholinergic drug. Histamine and the gastrin analogue stimulate acid and, to a lesser extent, pepsin secretion, and they inhibit mucus secretion; cholinergic stimulation increases the output of acid, chondroitin sulfate, pepsin and glycoproteins of the mucus. No qualitative changes in the secretion of peptic or mucous cells are observed.

3517 SECRETION OF SULFATED POLYSACCHARIDES BY THE GASTRIC MUCOSA.

(E.) Woussen-Colle, M. C. (Dept. Surg., Free U. Brussels, Belgium), G. Willems, J. Bremen, R. Ley, S. Verbeustel, A. Gerard and J. De Graef. *Digestion* 2(2):90-102, 1969.

Chondroitin-4-sulfate which is secreted by the chief peptic cells was found in the gastric fundic juice collected from Heidenhain pouches of 4 dogs. A chondroitin sulfate-like material was also observed in the pyloric cells of the same animals. In the dog chondroitin-4-sulfate secretion by the fundus was increased during cholinergic stimulation but not during pentagastrin or histamine stimulation. No sulfated polysaccharides have as yet been isolated from the gastric juice of other species. Histochemically, such a compound has also been demonstrated in the peptic and pyloric cells of the cat as in the dog and in mucous neck cells of the monkey.

3518 GASTRIC SECRETORY PATTERNS RELATIVE TO THE DIAGNOSIS OF THE ZOLLINGER-ELLISON SYNDROME.

(E.) Gaspard, D. J. (U. So. California Sch. Med., Los Angeles). *Amer Surg* 35(1):45-49, 1969.

Twenty-five patients undergoing biliary tract surgery for chronic cholecystitis with cholelithiasis were studied for the effect of preoperative medications and halothane or nitrous oxide anesthesia on gastric pH. Precision pH paper and intragastric monitoring of pH with a pH meter were found to give similar results. The patterns of gastric secretion in response to the administration of anticholinergics and general anesthesia were markedly variable. A large number of patients with cholelithiasis and cholecystitis continue to secrete acid and a few may start secreting acid intraoperatively.

3519 THE EFFECT OF XYLAMIDE (CR 242) ON THE GASTRIC SECRETION OF THE DOG AFTER HYPERSECRETORY STIMULATION.

(Sp.) Danhof, I. E. (Physiol. Dept., U. Texas, Austin). *Medicina (Mex)* 49(1054):107-114, 1969.

3520 ANTISECRETORY ACTIVITY OF SOME NEW COMPOUNDS WITHOUT AN ANTICHOLINERGIC EFFECT.

(Sp.) Rovati, A. L. (Rotta Res. Lab., Milan, Italy), P. L. Casula and G. da Re. *Medicina (Mex)* 49(1054): 81-84, 1969.

3521 GASTRIC PROTEINASES APPARENT IN PIGS AFTER ELECTROPHORESIS IN AGAR GEL.

(Fr.) Agneray, J. (Herold Hosp., Paris, France) and J. C. Jardillier. *Ann Biol Clin (Paris)* 27(1/2):115-119, 1969,

3522 **THE PYLORIC ANTRUM AS A REGULATOR OF GASTROINTESTINAL SECRETIONS.** *(Rev.)(E.)* Cooke, A. R. (Royal Prince Alfred Hosp., Sydney, Australia). *Med J Aust* 1(18):933-936, 1969.

3523 **STUDY OF INHIBITORS OF THE INTESTINAL ABSORPTION OF VITAMIN B_{12} IN HUMAN GASTRIC JUICE.** *(Fr.)* Wolff, R. (Fac. Med., Nancy, France), J. P. Nicolas and C. Trabelsi. *C R Soc Biol (Paris)* 161(7):1654-1657, 1967.

3524 **EXPERIMENTAL STUDIES ON THE ISOLATED HUMORAL FACTOR WHICH PROMOTES THE SECRETORY ACTIVITY OF THE GASTRIC CHIEF CELLS AND THE EXOCRINE PANCREATIC CELLS. II. AMINO ACIDS AND RELATED COMPOUNDS IN THE EXTRACT OF THE GASTRIC MUCOSA.** *(E.)* Fujie, K. (Wakayama Med. Coll., Japan), Y. Mabuchi, K. Ishimura and J. Hiraoka. *Wakayama Med Rep* 12(3):99-108, 1967.

3525 **STOMACH SECRETION IN THE OPERATED STOMACH.** *(Sp.)* Freytes, M. A. (Semiol. Dept., Natl. U. Cordoba, Spain). *Rev Fac Cienc Med Cordoba* 25(3):327-331, 1967.

See also: 3444,3461,3462,3463,3501,3616,3632,3934,3940

3526 **A MODIFICATION OF A CHRONIC PANCREATIC FISTULA IN THE DOG.** *(E.)* Stening, G. F. (UCLA Sch. Med., Los Angeles, Calif.). *Brit J Surg* 56(4):308-310, 1969.

A modification of the chronic pancreatic fistula procedure of Preshaw and Grossman (Gastroenterology 48:36, 1965) consists of separation of the pouch receiving the pancreatic duct from the duodenum by a longer metal cannula. This was designed to overcome the complication of unwanted communication between the pouch and duodenum. The procedure has been used in 15 dogs for periods, and in 4, who had the preparation for 32 weeks, there was no evidence of pouch leak.

3527 **THE FUNCTION OF THE EXOCRINE PANCREAS AFTER VAGOTOMY. EXPERIMENTAL STUDY.** *(It.)* Vecchioni, R. (Inst. Gen. Clin. Chir., U. Padua, Italy), C. Cordiano and G. Perrino. *Acta Chir Ital* 24(1):27-37, 1968.

Glucose, secretin and Mecholyl tests were performed on 2 groups of 15 rats, 15 days and 2 months after vagotomy. Two hr after glucose administration glycemia increased from 100 mg% to 240 and 150 resp.; serum amylase from 180 U Somogyi/cc to 280 and 230, resp. After secretin stimulation pancreatic secretion increased from 60 µliter to 120 and 240 resp.; serum amylase from 400 U Somogyi/cc to 800 and 1200; serum lipase from 80 U Biondi to 100 and 100; trypsin from 250 µg/ml to 400 and from 350 to 380. After Mecholyl pancreatic secretion increased from about 90 µliter to 100 and 150, resp.; serum amylase from 600 U Somogyi to 2400 and 2400; serum lipase from 60 U Biondi to 300 and 300; trypsin from 300 µg/ml to 1200 and 1000, resp.

3528 **EXOCRINE SECRETION IN THE RAT PANCREAS.** *(It.)* Vecchioni, R. (Inst. Gen. Clin. Chir., U. Padua, Italy), C. Cordiano and G. Perrino. *Acta Chir Ital* 24(1):75-88, 1968.

Exocrine pancreatic function was studied in 10 rats given 0.70/kg body weight of glucose, in 10 rats injected in the femoral vein with 1 U/rat secretin, and in 10 rats injected s.c. with 0.5 mg/kg body weight Mecholyl. After glucose, the glycemia level increased from about 100 mg% to 160 (30 min) and to 250 (2 hr); serum amylase from about 180 U Somogyi/cc to 220 (90 min). After secretin, pancreatic secretion increased from about 120 µliter after 30 min to 300 µliter; serum amylase increased from about 600 U Somogyi to 1600; serum lipase decreased from 120 U Biondi to 100; and trypsin from 400 µg/ml to 100 µg/ml. After Mecholyl, pancreatic secretion increased to 150 µliter (60 min); serum amylase to 2400 U Somogyi; serum lipase to 280 U Biondi and trypsin decreased from 300 µg/ml after 60 min and then returned to normal. The rat is a good experimental model for the study of exocrine pancreatic function, giving secretory responses comparable to those in men.

3529 **EXOCRINE PANCREATIC FUNCTION IN THE RAT AFTER OCCLUSION OF WIRSUNG'S DUCT.** *(It.)* Vecchioni, R. (Inst. Gen. Clin. Chir., U. Padua, Italy), G. Perrino and C. Cordiano. *Acta Chir Ital* 24(1):101-108, 1968.

Serum amylase, serum lipase and trypsin levels were determined in rats with artificially occluded Wirsung's duct: 10 rats were given 0.70 g/kg body weight of glucose; 10 rats were given 1 U/rat secretin i.v.; and 10 rats were injected s.c. with 0.5 mg/kg body weight Mecholyl. After glucose, serum amylase, from a basal level of about 20 U Somogyi/cc, increased to 35 after 30 min, and over 60 after 2 hr; glycemia, from 100 mg%, increased to 140 (30 min), and to 180 (2 hr). After secretin, serum amylase from about 15 U Somogyi/cc, increased to 170 U after 60 and 90 min; trypsin was unchanged. After Mecholyl, serum amylase, from 13 U, increased to 18 U (30 min) and over 20 U (60 min); serum lipase, from 9 U Biondi, increased to 12 U (30 min) and over 20 U (60 min); trypsin was identifiable in the serum only after 90 min.

3530 **EXPERIMENTAL REFLUX PANCREATOGRAPHY AFTER INTUBATION OF THE DUODENUM PER OS.** *(E.)* Waldron, R. L. (Columbia-Presbyterian Med. Ctr., New York, N. Y.), H. E. Wollowick and D. Wilson. *Radiology* 90(2):338-341, 1968.

A double balloon method for isolating the pancreatic-duct opening and obtaining reflux pancreatography in dogs is described. Under light anesthesia the duodenal tube is placed and after lidocaine introduction into the loop of duodenum. The lidocaine is replaced by Hypaque under 100 to 110 mm Hg pressure. Reflux was found to occur in 7 of the 8 animals tested. There was no enzyme or microscopic evidence of pancreatic damage.

3531 **RELATIVE RATES OF HYDROLYSIS BY RAT PANCREATIC LIPASE OF ESTERS OF C_2-C_{18} FATTY ACIDS WITH C_1-C_{18} PRIMARY n-ALCOHOLS.** *(E.)* Mattson, F. H. (Miami Valley Lab., Cincinnati, Ohio) and R. A. Volpenhein. *J Lipid Res* 10(3):271-276, 1969.

See also: 3524,4150

3532 **EFFECTS OF ETHINYLESTRADIOL-INDUCED CHOLESTASIS ON BILE FLOW AND BILIARY EXCRETION OF ESTRADIOL AND ESTRADIOL GLUCURONIDE BY THE RAT.** *(E.)* Kreek, M. J. (Rockefeller U., New York, N. Y.), R. E. Peterson, M. H. Sleisenger and G. H. Jeffries. *Proc Soc Exp Biol Med* 131(2):646-650, 1969.

Female Sprague-Dawley rats weighing 150 to 180 g were fed ethinylestradiol (0.5 mg in saline suspension, p.o.) daily for 9 days. On the 10th experimental day, the bile duct was cannulated and its femoral vein catheterized. From then until the end of the study bile flow was strikingly reduced to less than 50% of the control group in the estrogen treated animals. One day following surgery, studies of biliary excretion were performed revealing a markedly diminished biliary excretion of radioactivity from i.v. administered tracer doses of both estradiol and estradiol glucuronide in the treated animals. The effect of estrogen on bile flow and estrogen excretion in the bile was similar to BSP.

3533 **EFFECT OF PERFUSING BLOOD ON SERUM PROTEIN PRODUCTION BY ISOLATED PERFUSED LIVERS FROM NORMAL AND TUMOR-BEARING RATS.** *(E.)* Toporek, M. (Jefferson Med. Coll., Philadelphia, Pa.). *Cancer Res* 29(6):1267-1271, 1969.

Isolated perfused rat liver experiments were carried out in which normal livers and livers from Walker 256 tumor-bearing rats were perfused with either normal blood or blood from tumor-bearing rats. The serum protein synthetic activity of the perfused livers was determined by evaluating the incorporation of ^{14}C-L-lysine-6 into total serum protein and the albumin and α- and β-globulin fractions of the perfusing blood. Radioactivity of the protein samples was determined by combustion to CO_2, absorption in an ethanol-amine-ethylene glycol monomethyl ether solution, followed by liquid scintillation counting. Blood from tumor-bearing rats seems to carry an inhibitory signal which causes a decrease in the serum protein synthetic activity of the perfused liver. Normal livers perfused with blood from tumor-bearing rats had a lower serum protein synthetic activity than normal livers perfused with normal blood. Livers from tumor-bearing rats had a lower serum protein synthetic activity when perfused with blood from tumor-bearing rats than livers from tumor-bearing rats perfused with normal blood. Also, livers from tumor-bearing rats perfused with normal blood have a higher serum protein synthetic activity than livers from normal rats perfused with normal blood.

3534 **CONJUGATION OF N-ACETYL-p-AMINOPHENOL (N.A.P.A.) IN ADULT LIVER PATIENTS.** *(E.)* Fevery, J. (Academisch Ziekenhuis St.-Rafael, Louvain, Belgium) and J. deGroote. *Acta Hepatosplen (Stuttgart)* 16(1):11-18, 1969.

Conjugated and unconjugated N-acetyl-p-aminophenol (NAPA) were measured in the urine of 38 adult liver patients (parenchymal disease 26, obstructive jaundice 9, Gilbert's disease 3) with 14 controls and the serum of 34 adult liver patients (parenchymal disease 24, obstructive jaundice 9, Gilbert's disease (1) at varying intervals after their ingestion of NAPA (10 mg/kg). Urinary excretion of unconjugated NAPA was somewhat more elevated in liver patients than in controls. Patients with hyperbilirubinemia above 50 mg/liter showed significantly higher serum levels of unconjugated NAPA. Hepatitis did not significantly increase unconjugated serum NAPA. With Gilbert's disease, both serum and urinary levels of the unconjugated form were elevated. Serum levels of conjugated NAPA were not significantly lowered in liver patients because of wide scattering. Jaundice seems to impair the metabolism of NAPA either by decreasing the rate of conjugation, or by competition in the uptake of the hepatocyte, or by transport to the blood of the already conjugated form.

3535 **HEPATIC LIPIDOSIS ASSOCIATED WITH L-ASPARAGINASE TREATMENT.** *(E.)* Gross, M. A. (Wadley Inst. Molecular Med., Dallas, Texas), R. J. Speer and J. M. Hill. *Proc Soc Exp Biol Med* 130(3):733-736, 1969.

Fatty infiltration of the liver after i.p. administration of partially purified *E. coli* L-asparaginase was investigated in normal male C3H mice. Marked hepatic lipidosis developed in the mice which had been given varying dosages of low specific activity L-asparaginase over a 5-day period. Quantitative analyses and cytological studies confirmed this abnormal fat accumulation, in the form of triglycerides, compared with control animals given physiologic saline. However, enzyme of high specific activity was not steatogenic to mice at the highest dose levels administered. Pure L-asparaginase *per se* does not appear to be steatogenic to mice. Quantitative analyses of liver tissues from 5 L-asparaginase-treated leukemic patients showed marked hepatic lipidosis, regardless of the amount or the specific activity of the enzyme which had been administered. The severity of the lipidosis seemed quite unrelated to the dose or the purity of enzyme used.

3536 **STUDIES OF LIPOPROTEINS ISOLATED FROM RAT SERUM AFTER *IN VITRO* TREATMENT WITH CARBON TETRACHLORIDE.** *(E.)* Ugazio, G. (Inst. Gen. Pathol., U. Turin, Italy) and P. Pani. *Life Sci* 7(13):699-705, 1968.

Pooled sera from starved rats was incubated with carbon tetrachloride after which lipoproteins, total lipids, triglycerides, free fatty acids, and proteins were extracted; sera from rats that had received 10 μC of ^{14}C DL-1-leucine/100 g of body weight and incubated for 2 hr with ^{14}C; the very low density (VLD) lipoprotein fraction was incubated with or without CCl_4; and the serum of a third group was incubated under $^{14}CCl_4$ vapors and the VLD, low density (LD), and high density (HD) lipoprotein fractions counted. The VLD and LD lipoprotein fractions diminished progressively after *in vitro* CCl_4 treatment while the HD fraction increased. With *in vivo* treatment all fractions diminished in 4 hr. The serum lipoprotein, protein levels of the VLD, LD, and HD all fell with both *in vivo* and *in vitro* CCl_4 treatment of serum.

3537 HETEROLOGOUS LIVER PERFUSION. A POSSIBILITY OF TEMPORARY LIVER SUBSTITUTION. *(Ger.)* Boeckl, O. (Provincial Hosp., Salzburg, Austria). *Z Ges Exp Med* 147(2):81-105, 1968.

Hepatectomy was performed on Minnesota pigs; the liver was washed free of blood and perfused with a pump-oxygenator. Liver function was assessed during perfusion by determinations of bile production and of substances excreted in the bile: bilirubin, cholesterin, BSP, and ^{131}I-Rose Bengal tests. The perfusion circuit was loaded with ammonium citrate, and urea synthesis in the liver was studied. Colloidal ^{198}Au was used to study the functional capacity of the reticuloendothelial system. Blood gas analysis and determinations of erythrocytes, electrolytes and liver enzymes were carried out during perfusion. The investigations showed satisfactory function of the liver perfused with heterologous conserved human blood (blood bank). The technique was also tried in a 55-yr-old patient in liver coma. SGPT values rose from 11.9 at the beginning of perfusion to 26.6 after 3 hr of perfusion and SGOT rose from 52 at the start of perfusion to 206 after 3 hr. Alkaline phosphatase decreased from an initial value of 295 mEq/ml to 136 after 3 hr. Liver perfusion with heterologous preserved blood may be useful in hepatic failure and *Amanita* poisoning.

3538 ADENYLATE KINASE ACTIVITY IN RAT LIVER. *(E.)* Adelman, R. C. (Temple U. Sch. Med., Philadelphia, Pa.), C. H. Lo and S. Weinhouse. *Advances Enzym Regulat* 6:425-436, 1968.

Adenylate kinase activity was assayed spectrophotometrically in the livers of normal and alloxan-diabetic male CFN rats (170 to 210 g). Adenylate kinase activity was present only in the soluble and mitochondrial fractions of rat liver. The supernatant fraction contained 90% of the total activity. Normal animals fasted for 48 hr demonstrated a 3-fold increase in the mean specific activity of the supernatant enzyme, while the mitochondrial enzyme activity did not significantly change. Feeding glucose to similarly fasted animals resulted in a 90% decrease in activity for the supernatant enzyme. Mitochondrial enzyme activity was again unaffected. The specific activity of the supernatant enzyme diminished slightly with high fat and high protein diets, while mitochondrial activity was unchanged. Specific activity levels of adenylate kinase were similarly affected in adrenalectomized rats following dietary changes but in a lesser magnitude. The activity in livers of fed diabetic rats was the same as that in normal fasted ones, and 23 hr after insulin injection it was lowered 65%. Mitochondrial activity was unchanged. Enzyme activity in glucose-fed fasting normal rats decreased 50% in 8 hr and reached 12% in 16 hr. After a 12 hr lag period the effect of insulin in diabetic rats dropped enzyme levels to that of normal fed rats by 20 to 24 hr. After an additional 12 hr, recovery to the fasted level took place. Insulin treatment of normal fed rats did not affect supernatant enzyme activity. Adenylate kinase activity was found in lesser amounts in the kidney, intestinal mucosa, adipose tissue and brain.

3539 EFFECT OF CYCLOHEXIMIDE ON RIBOSOME FORMATION IN THE MOUSE LIVER. *(E.)* Trakatellis, A. C. (Brookhaven Natl. Lab., Upton, N. Y.) and M. J. Montjar. *Life Sci* 7(8):413-419, 1968.

Cycloheximide (10 mg/kg) was administered i.p. to adult male BNL Swiss mice (22 to 25 g average weight). ^{3}H-Uridine (2.5 mC/100 g) was administered i.p. 2 hr before the animals were sacrificed. The decrease in radioactivity of the 28S ribosomal ribonucleic acids (r-RNA) and the 18 Sr-RNA compared to controls was proportional to the period of time of exposure to cycloheximide. The slight decrease in specific activity of r-RNA (18S and 28S) which was observed after exposure to cycloheximide for 2 hr was very pronounced after exposure for 4, 8, and 12 hr. The inhibitory effect of cycloheximide on ribosome formation became very pronounced after exposure for 6 and 12 hr. This was manifested by a decrease in radioactivity of the polysome and ribosome fractions.

3540 HORMONAL EFFECT ON NUCLEOLAR RNA POLYMERASE IN NORMAL LIVER AND HEPATOMA CELLS. *(E.)* Miura, Y. (Chiba U. Sch. Med., Japan). *Advances Enzym Regulat* 6:439-451, 1968.

The effect of prednisolone (1 mg/100 g body weight) and estradiol (10 μg/150 g body weight) given *in vivo* on normal and malignant rat liver cell nuclei was assayed *in vitro* using the incorporation of ^{14}C-CTP into RNA as an indicator of RNA polymerase activity. DNA-dependent RNA polymerase was found in both the chromatin and nucleolar fractions of normal and malignant liver cells. Nucleolar RNA polymerase was more sensitive to estradiol than was chromatin RNA polymerase in normal and hepatoma cells. Chromatin RNA polymerase in hepatoma cells was rather insensitive to estrogen. The administration of prednisolone resulted in a shift of radioactivity from the ribosomal portion to lower molecular weight RNA after 8 hr. The analytical results of *in vitro* synthesized RNA by nucleolar RNA polymerase did not show ribosomal precursor but only 6S RNA.

3541 STUDIES ON THE SWELLING AND FORMATION OF LIPID PEROXIDE INDUCED BY FERROUS ION IN ISOLATED LIVER MITOCHONDRIA. I. RELATION AMONG PEROXIDATION, SWELLING AND ADENOSINETRIPHOSPHATASE IN ISOLATED MITOCHONDRIA. *(E.)* Kawasaki, S. (Yamaguchi U. Sch. Med., Japan) and K. Sakurai. *Bull Yamaguchi Med Sch* 14(4):323-327, 1967.

In Tris-KCl buffer solution (pH 7.4) mouse liver mitochondria to which ferrous ions were added retained their slow oxygen consumption for a lag period after which extremely rapid oxygen consumption occurred. The length of the lag period and the amount of lipid peroxide formed were dependent on the concentration of the ferrous ion; the velocity of formation was determined by the concentration of mitochondrial protein. The mitochondrial function for the formation of lipid peroxide decreased gradually. An increase in Mg^{++} stimulated ATP activity, and maximal swelling of mitochondria appeared at the end of lipid peroxide formation. At the end of the process mitochondrial lysis and disintegration occurred; a remarkable energy requirement of ATP was demonstrated.

3542 INTERRELATIONS BETWEEN FATTY ACID OXIDATION AND THE CONTROL OF GLUCONEOGENESIS IN PERFUSED RAT LIVER. *(E.)* Williamson, J. R. (U. Pennsylvania, Philadelphia), E. T. Browning and M. S. Olson. *Advances Enzym Regulat* 6:67-100, 1968.

Oleic acid infusion into the livers of 24-30 hr starved rats perfused with *l*(+)alanine (5-10 mM), *l*(+)lactate (5-10 mM) or pyruvate (1.5-2.0 mM) increased their rate of glucose formation. The presence of 0.5 mM D(+)decanoyl carnitine abolished the stimulatory effect of oleic acid on gluconeogenesis from lactate. Fatty acid respiration appeared to control gluconeogenesis at the pyruvate carboxylase site by regulating the level of acetyl-CoA. Calculations of the intramitochondrial acetyl-CoA concentration yielded values which were more of the order of magnitude greater than the Ka for acetyl-CoA activation of pyruvate carboxylase *in vitro*. With alanine as a substrate, but not with either lactate or pyruvate control was also exerted at the glyceraldehyde-3-P dehydrogenase step by the elevated ratio of cytoplasmic $NADH/NAD^+$. After the addition of fatty acids to the perfused rat liver, there was a small increase of cytoplasmic and mitochondrial oxaloacetate mainly in the mitochondria with pyruvate as a substrate. Control of the citric acid cycle was shown to be mediated at the citrate synthase and isocitrate dehydrogenase steps. Citrate levels may either rise or fall after oleic acid addition (depending on the gluconeogenic precursor), while α-ketoglutarate levels invariably fall. Citrate levels changed in relation to the change of the mitochondrial oxaloacetate level which is "set" by the pyridine nucleotide redox potential. Control at the isocitrate dehydrogenase step appeared to be mediated by the availability of oxidized pyridine nucleotide.

3543 THE INFLUENCE OF HYDROCORTISONE ON LIPID METABOLISM IN THE RAT LIVER.

(E.) Smietańska, Z. (Clin. Intern. Dis., Med. Acad., Warsaw, Poland) and Z. Skowrońska. *Pol Endocr* 19(3-4):163-167, 1968.

Seven Wistar rats (135-185 g) received 5 mg hydrocortisone i.p. followed by ^{14}C-tagged hydrocortisone (1-μC/3 g) i.p. 2 hr later. Levels of cholesterol were significantly lower in the livers of the rats that had received hydrocortisone than in controls. Levels of fatty acids were higher in the treated groups but the synthesis of fatty acids was inhibited (control value 1810 impulses/g of liver versus treated 833 impulses/g of liver). Hydrocortisone lowers the content of cholesterol and increases fatty acids in the rat liver. The inhibition of fatty acid synthesis is not due to a direct influence on synthesis but seems to be connected with the accumulation of fatty acids in the liver.

3544 SEQUENTIAL FEEDBACK INHIBITION AND REGULATION OF LIVER CARBOHYDRATE METABOLISM THROUGH CONTROL OF ENZYME ACTIVITY.

(E.) Weber, G. (Indiana U. Sch. Med., Indianapolis), M. A. Lea and N. B. Stamm. *Advances Enzym Regulat* 6:101-123, 1968.

The effective inhibitory concentrations of the free fatty acids (FFA) octanoic, lauric, myristic, palmitic, and elaidic acids were in the physiologic range of rat (100-200 g male Wistar) or human systems. When acetyl-CoA was added to the reaction mixture of liver pyruvate kinase assay system a $K_i = 5.1$ mM was found, but when it was added to the supernatant fluid for a 10 min preincubation a $K_i = 30$ μM was observed. The inhibition was not of a competitive type and required only a few seconds. Acetyl-CoA also inhibited rat muscle pyruvate kinase noncompetitively with a $K_i = 2.0 \times 10^4$ M. Acetyl-CoA noncompetitively inhibited glucokinase in a preincubation system, yielding a $K_i = 75$ μM. Acetyl-CoA failed to inhibit liver hexokinase phosphofructokinase, lactate dehydrogenase, glucose 6-phosphate, fructose 1,6-diphosphate, yeast glucose 6-phosphate dehydrogenase and rabbit muscle lactate dehydrogenase. FFA, an end product of glucose catabolism, inhibited hexokinase, glucokinase, phosphofructokinase while acetyl-CoA, an end product of FFA metabolism, inhibited glucokinase and pyruvate kinase activities. This phenomenon was called sequential feedback. Phosphoenolpyruvate when preincubated for 10 min with liver supernatant fraction caused a progressive noncompetitive inhibition of glucokinase activity with a $K_i = 2.1$ mM. The K_m for glucokinase was not affected. Liver hexokinase was not inhibited by phosphoenolpyruvate (PEP). At the usual PEP concentration employed in routine pyruvate kinase assay system, L-alanine was not inhibitory with or without preincubation. At low concentrations of PEP, L-alanine acted as a competitive inhibitor of PEP. Using a preincubation mixture alanine protected pyruvate kinase from thermal inactivation. D-alanine and beta alanine were not inhibitory to liver pyruvate kinase and neither of them or L-alanine inhibited muscle pyruvate kinase. L-alanine exerted no effect no hepatic glucokinase, hexokinase, glucose 6-phosphate or 1,6-diphosphatase when added to the incubation mixture, or with preincubation, or at different levels of the respective substrates.

3545 THE EFFECTS OF ETHANOL ON THE METABOLIC ACTIVITIES OF THE LIVER.

(E.) Krebs, H. A. (Nuffield Dept. Clin. Med. U. Oxford, England). *Advances Enzym Regulat* 6:467-480, 1968.

The interreaction of ethanol and nadide (NAD) with a fall in the $NAD/NADH_2$ ratio of the liver may explain the rise in the lactate/pyruvate ratio resulting from rat liver perfusion with ethanol. The decrease in the steady state concentration of pyruvate inhibited gluconeogenesis from certain substrates, especially lactate. Gluconeogenesis from other substrates such as alanine, serine, and galactose was directly influenced by the decreased $NAD/NADH_2$ ratio. The concentration of α-glycerophosphate rose in the liver with the decreased ratio. The accumulation of fat in the liver, hypoglycemia, hyperlactemia and hyperuricemia are postulated to result from these changes. It was concluded that alcohol upset the $NAD/NADH_2$ ratio of the cytoplasm and mitochondria of the hepatic parenchyma resulting in alcoholic liver disease.

3546 GLUCOCORTICOID CONTROL OF NUCLEAR SYNTHESIS AND OF MICROSOMAL HYDROLYSIS OF RIBONUCLEIC ACID AND ITS POSSIBLE SIGNIFICANCE IN THE HORMONAL RESPONSE OF LIVER.

(E.) Barnabei, O. (Inst. Gen. Physiol., U. Ferrara, Italy) and C. Ottolenghi. *Advances Enzym Regulat* 6:189-209, 1968.

The action of glucocorticoids on the liver of intact and adrenalectomized male Wistar-Glaxo rats, both adult and newborn, was investigated *in vivo*, and in isolated perfused rat liver. There was enhanced activity of nuclear DNA-dependent RNA polymerase, and increased incorporation of labeled precursors into nuclear and cytoplasmic RNA. Autohydrolysis of pulse-labeled microsomal RNA was reduced. Actinomycin D given, *in vivo*, concurrently with cortisone did not influence this action, while it completely prevented the increase of RNA polymerase. The p-chloromercuribenzoate, added *in vitro*, enhanced the "ribonuclease" activity of the microsomal preparations from treated animals more than that of controls. In newborn animals, the microsomal ribonuclease was depressed by hormonal treatment at the 4th day of life, whereas RNA polymerase failed to respond until the 13th day. In adults the increase of nuclear RNA polymerase activity induced by glucocorticoids was always accompanied by the decrease of microsomal ribonuclease activity. The decay of radioactivity of liver RNA, labeled with a pulse of 6-^{14}C-orotate, was slower in rats receiving a daily injection of cortisone. The control of both synthesis and hydrolysis of RNA is important in liver response to glucocorticoids.

3547 AUTOREGULATION OF GLUCOSE IN THE ISOLATED PERFUSED RAT LIVER. *(E.)* McCraw, E. F. (Indiana U. Sch. Med., Indianapolis), M. J. Peterson, G. Yarnell and J. Ashmore. *Advances Enzym Regulat* 6:57-65, 1968.

Glucose utilization and production by the isolated perfused rat (male albino Wistar rats, 200-250 g), were examined under a variety of conditions. Rat livers perfused with 20 mM lactate and increasing glucose concentrations from 3 to 55 mM came to a point of equilibrium at which glucose production equalled glucose utilization: this occurred with an initial glucose concentration of about 12 mM in the normal fasted rat and 20 mM in the alloxan diabetic. An increase in glucose utilization was observed in livers from diabetic rats with initial perfusate glucose concentrations greater than 30 mM. In prolonged fasting the utilization of glucose was not depressed to the extent that glucokinase was decreased.

3548 A ROLE FOR CARNITINE AND LONG CHAIN ACYLCARNITINE IN THE REGULATION OF LIPOGENESIS. *(E.)* Marquis, N. R. (Harvard Med. Sch., Boston, Mass.), R. P. Francesconi and C. A. Villee. *Advances Enzym Regulat* 6:31-55, 1968.

In the absence of citrate or other acetyl-CoA carboxylase activator, fatty acid synthesis from acetate or low levels of citratein cell free preparations of rat liver (200 g males) proceeded at a very low rate. Under these conditions the addition of carnitine resulted in a further decrease in free fatty acid synthesis. When high concentrations of citrate were added, carnitine stimulated lipogenesis from both acetate and citrate. In the absence of citrate, acetyl-CoA was shuttled into acetylcarnitine in the presence of carnitine, whereas at high concentrations of citrate and increased acetyl-CoA carboxylase activity, acetyl CoA was preferentially utilized in the synthesis of fatty acids. Both palmitoyl(+)carnitine and palmitoyl(-)carnitine stimulated lipogenesis in high speed supernatant liver preparations. Palmitoyl(-)carnitine in addition stimulated acetyl-CoA carboxylase but did not effect the incorporation of malonyl-CoA into long chain fatty acids in high speed preparations. Only malic enzyme, malate and lactate dehydrogenases were not inhibited by palmitoyl-CoA. Of the enzymes inhibited only citrate synthase, acetyl-CoA carboxylase and carnitine acetyltransferase were relieved by palmitoylcarnitine.

3549 METABOLIC AND MORPHOLOGIC STUDIES OF HEPATOCARCINOGENESIS IN THE RAT. *(E.)* Peraino, C. (Argonne Natl. Lab., Ill.) and R. J. M. Fry. *Argonne Nat Lab ANL* (7535):39-42, 1968.

Prolonged feeding of acetylaminofluorene (AAF) to rats produced hepatomas. The onset of the tumor was preceded by increased proliferative activity of hepatocytes. After hepatomas appeared, the surrounding hepatocytes also exhibited increased proliferative activity. Of the adaptive enzymes studied, ornithine aminotransferase and serine dehydratase showed responses that suggest that their regulatory systems are altered during carcinogenesis. The feeding of phenobarbital at the same time as AAF reduced both the toxic and carcinogenic activity of AAF. When phenobarbital was fed after exposure to AAF, the protective effect was replaced by an apparent enhancement of the effects of AAF.

3550 PERFUSION OF THE ISOLATED LIVER: BEHAVIOR OF ISOENZYMES OF ESTERASE ACTIVITY IN SUBCELLULAR FRACTIONS. *(It.)* Negri, S. (Inst. Clin. Gen. Med., U. Milan, Italy), S. Procaccia, C. Santambrogio, L. Tenconi and N. Massari. *Biol Lat* 21(1):95-98, 1968.

Isolated male albino rat livers were perfused by a modification of the method of Miller (J. Exper. Med. 94:431, 1951). Isoenzymes with esterase activity were determined by cellulose acetate electrophoresis, after fractionation of the liver cells into nuclear, mitochondrial, microsomal and soluble cytoplasmic fractions. An increase in the total enzymatic activity was observed in all the fractions, except the cytoplasmic, but no qualitative modification of the isoenzyme pattern.

3551 THE BEHAVIOR OF SOME ENZYMES IN DICUMAROL-TREATED RAT LIVER. *(It.)* Rossi, L. (Catholic U. S. Cuore, Rome, Italy), G. Bombardieri and F. Renda. *Gazz Int Med Chir* 73(22):1981-1990, 1968.

The behavior of liver succinic dehydrogenase, cytochrome oxidase and endogenous respiration was determined in normal male Wistar rats injected with dicumarol (5 mg/100 g body weight) per day for 2 days; and in rats injected with 2-6 mg/100 g body weight per day dicumarol for 8 days. The endogenous respiration and the succinic dehydrogenase activity were not modified, but cytochrome oxidase activity (control value 385 μliter O_2) decreased to 341 μliter O_2 in the rats treated for 2 days and to 317 in the rats treated for 8 days. The difference between control and treated mice in cytochrome oxidase activity was statistically significant ($0.05 > P > 0.02$). The significant diminution in cytochrome oxidase activity in treated animals may be due to a selective inhibition of the synthesis of the enzyme by dicumarol.

3552 CHOLESTEROLIC POLYCORIA IN THE ADULT. (I) CLINICAL AND HISTOCHEMICAL STUDY. *(Fr.)* Lageron, A. (St. Antoine Hosp., Paris, France), I. Caroli, H. Stralin and P. Barbier. *Presse Med* 75(54):2785-2790, 1967.

The first case of a new hepatic disease in a 43-yr-old man, characterized by changes in liver cholesterol metabolism, is presented. When the patient was 14, a huge hepatomegaly was found, clinically and histologically latent. Laparoscopic studies, undertaken for sigmoid polyps 10 and again 2 yr ago, showed a hypertrophic, butter-colored liver. Histological studies of surgical biopsies demonstrated the presence of droplets of lipids in 100% of the hepatocytes, so the cells looked like spongiocytes. All tests of hepatic function were normal but the BSP clearance was increased. Electron microscope examination confirmed the presence of lipid droplets of variable size. Histochemical determinations of the lipid components revealed the presence of neutral lipids, a large amount of cholesterol, a slight increase in glycogen, absence of glucose-6-phosphate dehydrogenase and 6-phospho-gluconate-dehydrogenase, normal Krebs cycle and normal protein content.

3553 CHOLESTEROLIC POLYCORIA IN THE ADULT (II). BIOCHEMICAL SURVEY. *(Fr.)* Infante, R. (St. Antoine Hosp., Paris, France), J. Polonovski and J. Caroli. *Presse Med* 75(55):2829-2832, 1967.

Cholesterolic polycoria, characterized by a massive increase of cholesterol esters in the hepatocytes, associated with several alterations in lipid metabolism, has been studied. A liver specimen was obtained by biopsy and lipids, phospholipids, cholesterol, esterified fatty acids and nonesterified fatty acids were determined. *In vitro* synthesis of lipids from acetate-^{14}C, from palmitate-1-^{14}C, and incorporation of glucose-^{14}C in lipids and glycogen were studied. Total lipids were 244 mg/g tissue (normal value 60 mg/g tissue), and cholesterol esters (mainly cholesteryloleate and linoleate) were 101 mg/g tissue (normal value 0.6 mg/g tissue). Phospholipids were not modified, except phosphatidyl ethanolamine, which was slightly decreased. Nonesterified fatty acids were absent in the plasma, also after epinephrine stimulus. Synthesis from acetate was greatly reduced in phospholipids and the triglyceride fraction increased about 20 times in the cholesterol esters. Fatty acid oxidation was markedly reduced and glucose incorporation was increased in cholesterol esters and was normal in glycogen. The absence of cholesterolesterase may be the etiopathogenic factor in cholesterolic polycoria.

3554 HEPATIC AND INTESTINAL REGULATION OF AMMONIEMIA IN THE CARP. *(Fr.)* Pequin, L. (Fac. Sci., Toulouse, France) and F. Serfaty. *Arch Sci Physiol* 22(3):449-459, 1968.

The origin of ammonia excretion in the carp (*Cyprinus carpio*), was studied. Results showed a system of regulation of ammoniemia mainly located in the liver and in the intestine. Tissue glutamine originates not only in the brain, but, to a similar degree, in the liver and the intestinal mucosa where the largest amount of ammonia of external and internal origin is present and is transofrmed, for the most part, into glutamine. Comparable activities of glutamine synthesis were determined: in the brain over 200 μM γ-glutamyl-mono hydroxamate/hr/g dry tissue were synthesized; in the liver over 50 μM; and in the intestinal mucosa between 100 and 150 μM.

3555 PERFUSION OF ISOLATED LIVER: ACTION IN TIME OF TOTAL OF TISSUE ATP. *(It.)* Negri, S. (Inst. Clin. Med., U. Milan, Italy), C. Santambrogio, S. Procaccia and L. Tenconi. *Biol Lat* 21(1):103-106, 1968.

Isolated male albino rat livers wete perfused using Miller's method (a pump oxygenator). The amount of hepatic ATP was indirectly determined by measuring the quantity of DPNH consumed in the reaction converting phosphoglycerate to phosphoglyceraldehyde. Results showed that contrary to other enzyme activities, the content of ATP remained virtually unchanged in the 4 hr of examination. This finding is probably due to a reduced synthesis and degradation of ATP.

3556 METABOLIC ASPECTS OF REGENERATING LIVER AFTER SUBTOTAL HEPATECTOMY IN AGED RATS. *(It.)* Tonelli, M. (Ist. Semeiotica Med., U. Parma, Italy), P. Pietranera and M. Passeri. *Riv Gastroent* 20(3):219-228, 1968.

Thirty rats, 14 months old weighing more than 500 g were subjected to subtotal hepatectomy, sacrificed after 28, 32, 36, 47, or 52 hr and hepatic glycogen, pyruvate and lactate measured. The glycogen in intact liver of old mice was reduced in comparison with young animals, and 52 hr after hepatectomy the amount was still lower than basal values. After hepatectomy pyruvate presented an analogous behavior: slow decrease in the first hr and stationary low levels until 52 hr. The hepatic lactate concentration in old animals was 2 times higher than in young animals and rapidly decreased after hepatectomy. All these phenomena seem to be correlated with a reduction in protein synthesis during aging.

3557 NERVOUS CONTROL OF THE ACTIVITY OF THE LIVER. *(It.)* Procacci, P. (Inst. Spec. Med. Pathol., U. Florence, Italy) and G. Bozza. *Fegato* 13(3): 265-283, 1967.

3558 THE EFFECT OF DEACYLATED PHOSPHATIDYLCHOLINE, PHOSPHATIDYLETHANOLAMINE, PHOSPHATIDYLSERINE AND PHOSPHATIDYLINOSITOL ON LIVER REGENERATION. *(It.)* Pacini, N. (Inst. Microbiol. Vet. Immunological, U. Milan, Italy) *Epatologia* 13(3):767-772, 1967.

3559 POSSIBLE ROLE OF PHOSPHOLIPIDS IN LIVER REGENERATION. *(It.)* Meoni, G. C. (Inst. Systemic Med. Ther., U. Rome, Italy) and T. Traetta. *Epatologia* 13(3):759-766, 1967.

3560 AN EXPERIMENTAL STUDY OF THE EFFECT OF OROTIC ACID ON LIVER REGENERATION. *(It.)* Charbonnier, A. (U. Hosp. Ctr., Paris, France), C. Lafille, J. Rousselot and M. Cachin. *Epatologia* 13(3):749-758, 1967.

3561 THE EFFECT OF TOLBUTAMIDE ON LIVER REGENERATION. *(It.)* Cascio, G. (Inst. Pharmacol. Pharmacognosy, U. Palermo, Italy) and G. Mantia. *Epatologia* 13(3):743-748, 1967.

3562 LIVER REGENERATION AFTER MAJOR HEPATECTOMY IN THE DOG. *(Fr.)* Mallet-Guy, P. (Med. Fac., Lyon, France), N. Chanelière, M. Barbier, P. Espinasse, J. Féroldi and Y. Mallet-Guy. *Epatologia* 13(3): 611-620, 1967.

3563 IMMUNOCHEMICAL STUDIES ON THE LIVER CATALASE DEPRESSION BY TOXOHORMONE. *(E.)* Hozumi, M. (Natl. Cancer Ctr. Res. Inst., Tokyo, Japan), K. Matsuoka and T. Sugimura. *Gann* 58(6):555-563, 1967.

3564 **METABOLISM OF CARCINOGENIC COMPOUNDS. I. EFFECT OF PHENOBARBITAL ND METHYLCHOLANTHRENE ON THE ACTIVITIES F N-DEMETHYLATION OF CARCINOGENIC COMPOUNDS Y LIVER MICROSOMES OF MALE AND FEMALE RATS.** *E.)* Kato, R. (Natl. Inst. Hyg. Sci., Tokyo, Japan), H. Shoji nd A. Takanaka. *Gann* 58(5):467-469, 1967.

3565 **EFFECT OF GLUCOCORTICOIDS ON NUCLEIC ACID METABOLISM OF RAT ASCITES IEPATOMA.** *(E.)* Moriyama, Y. (Chiba U. Sch. Med., Japan). *ann* 58(2):107-113, 1967.

3566 **PRIMING ACTIVITY FOR RNA SYNTHESIS OF CHROMATIN FROM TRANSPLANTABLE IEPATOMAS AND LIVERS OF TUMOR-BEARING RATS.** *E.)* Omata, S. (Natl. Inst. Radiol. Sci., Chiba, Japan) and . Ichii. *Gann* 58(1):55-59, 1967.

3567 **EFFECT OF BARBITAL ON CARCINOGENIC ACTION AND METABOLISM OF 4-DIMETHYLMINOAZOBENZENE.** *(E.)* Ishidate, M. (Tokyo Biochem. es. Inst., Japan), M. Watanabe and S. Odashima. *Gann* 8(3):267-281, 1967.

3568 **EXPERIMENTAL BILE DUCT LIGATION AS A DETERMINING FACTOR IN LIVER EGENERATION.** *(It.)* Venuti, V. M. (Inst. Spec. Surg. athol., U. Rome, Italy), E. Santoro, A. Bandini and E. amacchia. *Epatologia* 13(3):689-696, 1967.

569 **A STEATOGENIC DIET AND LIVER REGENERATION: AN EXPERIMENTAL STUDY.** *It.)* Bevilacqua, G. (U. Polyclin., Milan, Italy), G. Gallioli and . Rognoni. *Epatologia* 13(3):823-838, 1967.

570 **EFFECTS OF EQUIVALENT AND SYNCHRONOUS FEEDING ON COMPENSATORY IVER HYPERTROPHY IN THE WHITE RAT.** *(Fr.)* olimard, R. (J. Logeais Chem. Physiol. Res. Lab., Paris, rance) and C. Menillet. *Epatologia* 13(3):815-821, 1967.

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573 **THE EFFECT OF SOME AMINO ACIDS AND SOME VITAMINS ON LIVER REGENERATION.** *It.)* Fanelli, V. (Inst. Systemic Med. Ther., U. Rome, Italy). *Epatologia* 13(3):777-780, 1967.

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3575 **REJECTED PROTONS IN THE LIVER AND KIDNEYS.** *(Pol.)* Majewski, C. (J. Strusi Munic. Hosp., Poznań, Poland), B. Wszolek and E. Kukiel. *Pat Pol* 18(4):485-490, 1967.

3576 **NUCLEAR REACTIONS INDUCED BY NEUTRONS FROM THE LIVERS OF RATS GIVEN ORAL BERYLLIUM.** *(Pol.)* Wszolek, B. (J. Strusi Munic. Hosp., Poznań, Poland), E. Kukiel and C. Majewski. *Pat Pol* 18(4):497-504, 1967.

3577 **STUDIES ON THE OCCURRENCE OF NEUTRONS IN THE LIVERS OF RATS WITH IMPLANTED GUERIN CARCINOMA.** *(Pol.)* Wszolek, B. (J. Strusi Munic. Hosp., Poznań, Poland), C. Majewski and E. Kukiel. *Pat Pol* 18(4):491-495, 1967.

3578 **NEPTUNIUM-237 TOXICITY IN THE RAT. II. INTRACELLULAR DISTRIBUTION OF NEPTUNIUM AND CERIUM IN RAT LIVER.** *(E.)* Mahlum, D. D. (Biol. Dept., Battelle Mem. Inst., Richland, Wash.). *Toxic Appl Pharmacol* 11(2):264-271, 1967.

3579 **THE METABOLISM OF BENZENE *IN VITRO*.** *(E.)* Snyder, R. (Jefferson Med. Coll., Philadelphia, Pa.), F. Uzuki, L. Gonasun, E. Bromfeld and A. Wells. *Toxic Appl Pharmacol* 11(2):346-360, 1967.

3580 **THE PATHOGENESIS OF HEPATIC STEATOSIS DUE TO CARBON TETRACHLORIDE.** *(It.)* Dianzani, M. U. (Maria Vittoria Hosp., Turin, Italy). *G Batt Virol Immun* 60(1/2):49-65, 1967.

3581 **HYDROXYLASE ACTIVITY AND HEMOPROTEIN CONTENT OF MICROSOMES FROM RABBIT LIVER.** *(E.)* Lange, G. (Inst. Pharmacol., U. Munich, Germany). *Naunyn Schmiedeberg Arch Pharm Exp Path* 259(1):221-238, 1967.

3582 **LIPOLYTIC ACTIVITY OF THE LIVER IN INTACT AND CASTRATED RATS TREATED WITH TESTOSTERONE, 4-CHLOROTESTOSTERONE AND GONADOTROPINS.** *(It.)* Cioni, P. (Inst. Gen. Pathol., U. Florence, Italy) and F. Tinacci. *Sperimentale* 115(6):423-432, 1965.

3583 **THE EFFECT OF METYRAPONE ON MICROSOMAL DRUG METABOLISM.** *(E.)* Netter, K. J. (Inst. Pharmacol., U. Mainz, Germany), S. Jenner and K. Kajuschke. *Naunyn Schmiedeberg Arch Pharm Exp Path* 259(1):1-16, 1967.

3584 **LIGHT RIBONUCLEOPROTEIN PARTICLES IN THE CYTOPLASM OF RAT LIVER.** *(Fr.)* Quirin-Stricker, C. (Neurochemistry Ctr., C.N.R.S., Fac. Med., Strasbourg, France) and P. Mandel. *FEBS Letters* 2(4):230-232, 1969.

3585 EFFECT OF FEEDING AMINO AZO DYES ON MITOCHONDRIAL SWELLING AND CONTRACTION. KINETIC EVIDENCE FOR DELETION OF MEMBRANE REGULATORY SITES. *(E.)* Arcos, J. C. (USPHS Hosp., New Orleans, La.), J. B. Mathison, M. J. Tison and A. M. Mouledoux. *Cancer Res* 29(6):1288-1297, 1969.

3586 SEQUENTIAL ALTERATIONS IN MITOCHONDRIAL INNER AND OUTER MEMBRANE ELECTRON TRANSPORT AND IN RESPIRATORY CONTROL DURING FEEDING OF AMINO AZO DYES, STABILITY OF PHOSPHORYLATION. CORRELATION WITH SWELLING-CONTRACTION CHANGES AND TUMORIGENESIS THRESHOLD. *(E.)* Arcos, J. C. (USPHS Hosp., New Orleans, La.), M. J. Tison, H. H. Gosch and J. A. Fabian. *Cancer Res* 29(6):1298-1306, 1969.

3587 DIFFERENTIAL RESPONSES TO FASTING AND SUBSEQUENT FEEDING BY MICROSOMAL SYSTEMS OF RAT LIVER: 6- AND 9-DESATURATION OF FATTY ACIDS. *(E.)* Inkpen, C. A. (Dept. Biochem. Purdue U., Lafayette, Ind.), R. A. Harris and F. W. Quackenbush. *J Lipid Res* 10(3):277-282, 1969.

3588 THE EFFECT OF HISTONE FRACTIONS ON LIVER CATALASE AND TRYPTOPHAN PYRROLASE ACTIVITIES. *(E.)* Aoki, T. (Dept. Biochem., U. Texas, Houston), L. S. Hnilica and A. C. Griffin. *Arch Biochem* 131(2):538-542, 1969.

3589 COLLAGEN BIOSYNTHESIS IN NORMAL AND CIRRHOTIC RAT LIVER SLICES. *(E.)* Huberman, A. (Dept. Biochem., Natl. Inst. Nutr., Mexico City, Mexico), A. Recio and M. Rojkind. *Proc Soc Exp Biol Med* 131(1):200-203, 1969.

3590 STRAIN DIFFERENCES IN THE LIVER AUTO-ANTIBODY RESPONSE OF INBRED MICE. *(E.)* Flad, H. D. (Middlesex Hosp. Med. Sch., London, England) England), J. H. L. Playfair, A. Ghaffar and P. A. Miescher. *Proc Soc Exp Biol Med* 131(1):121-124, 1969.

3591 THE EFFECT OF A LIVER PREPARATION ON LIVER METABOLISM. *(Ger.)* Kovács, A. (1st Med. Clin., Budapest, Hungary), S. Kisfaludy and I. Magyar. *Z Gastroent* 7(1):36-41, 1969.

3592 REGENERATION, TUMOR, DIETARY, AND L-ASPARAGINASE EFFECTS ON ASPARAGINE BIOSYNTHESIS IN RAT LIVER. *(E.)* Patterson, M. K. (Samuel Roberts Noble Found., Inc., Ardmore, Okla) and G. R. Orr. *Cancer Res* 29(6):1179-1183, 1969.

3593 KINETICS OF HEPATOCELLULAR TRANSPORT OF BROMSULFALEIN. *(Fr.)* Begon, F. (Beaujon Hosp., Clichy, France), J. P. Benhamou, L. Pointard and A. M. Preaux. *Clin Chim Acta* 18(1):227-239, 1967.

See also: 3447,3449,3455,3467,3475,3483,3489,3688,3868,3869,4125,4261

Intestine

3594 MEASUREMENT OF DEOXYRIBONUCLEIC ACID (DNA) IN CANINE JEJUNAL FISTULAR FLUID. *(E.)* Goldsmith, D. P. J. (U. Nebraska Coll. Med., Omaha). *Gut* 10(6):497-501, 1969.

DNA in intestinal fluid has been assayed for its possible application in finding the desquamation rate of intestinal epithelium. Crude DNA was precipitated from identical aliquots of canine jejunal fistula secretion and washings by trichloroacetic acid (TCA) at -16C and the precipitates assayed by reaction with diphenylamine reagent, by reaction with indole reagent, and by absorption spectroscopy. The 3 methods gave similar values for the DNA content of all aliquots. The same 3 methods were used to assay samples of intestinal fluid to which pure DNA had been added before TCA precipitation and showed 80 to 99% recovery of the DNA added. The absorption spectrum obtained after reaction of intestinal DNA with diphenylamine reagent was essentially the same as with pure DNA, as was the spectrum of the intestinal DNA itself in the ultraviolet region. DNA in intestinal fluid can be evaluated specifically and quantitatively.

3595 RESPIRATION OF ISOLATED EPITHELIAL CELLS FROM THE RAT INTESTINE. *(Fr.)* Mitjavila, S. (Inst. Physiol., Toulouse, France), D. Gaillard and R. Derache. *Biol Gastroent* 2(Suppl. 2):183-192, 1968.

Intestinal epithelial cells of rats isolated by hyaluronidase digestion were incubated in the presence of tannin, with and without serum albumin or mucin. QO_2 (μliter O_2/mg protein/hr) and QL (μg lactic acid/mg protein/hr) were determined. In the controls, QO_2 and QL were 5.95 and 7.20, resp.; tannin at 0.02 mg/mg cell protein inhibited QO_2 by 6% and QL by 3%. The increased concentration of tanin in the medium to 1.75 mg/mg cell protein raised the percentage of QO_2 and QL inhibition to 76.2 and 56.8%, resp. When 0.85% albumin and 0.85% mucin were present in the medium without tannin, the QO_2 increased by 44% and 14%. If mucin and albumin were added to a medium containing tannin they interacted with tannin, by forming insoluble complexes. Albumin and mucin in excess bound 70% and 80% of the tannin, resp.

3596 INTESTINAL ABSORPTION AND METABOLISM OF C^{14}-LABELLED FATTY ACIDS IN THE ABSENCE OF BILE IN MAN. *(E.)* Blomstrand, R. (Serafimerlasarettet, Karolinska Inst., Stockholm, Sweden), G. Carlberger and L. Forsgren. *Acta Chir Scand* 135(4):329-339, 1969.

Intestinal absorption and metabolism of fatty acids were studied in 4 patients with complete biliary obstruction and 2 control subjects. ^{14}C-labeled fatty acids, oleic acid or a mixture of palmitic, stearic, oleic and linoleic acids were administered p.o. Examinations using: (A) radiorespirometry to determine the $^{14}CO_2$ in expired air, (B) thoracic duct cannulation and collection of lymph to determine ^{14}C-labeled fatty acids, and (C) collection of feces to determine the unabsorbed ^{14}C-labeled fatty acids were carried out. Fecal fatty acid analysis revealed that icteric patients absorbed only 20-54% of the administered radioactivity, against 93-97% in the controls. In the icteric patients 11-28% of the absorbed radioactivity was recovered in the lymph and 23-72% in expired air. For the control subjects percentages were 52-73 and 14-22%, resp. Ingested long-chain fatty acids are poorly absorbed in man in the absence of bile from the intestine. The normal absorptive mechanism by which long-chain fatty acids are transported by the lymphatic pathway as triglycerides operates less efficiently. A small portion of the absorbed fatty acids, however, enters the circulation by this route but the greater portion may be transported by the portal vein mainly as unesterified fatty acids.

3597 FATE OF TRYPSIN AND CHYMOTRYPSIN IN THE HUMAN SMALL INTESTINE. *(E.)* Goldberg, D. M. (Western Infirm., Glasgow, Scotland), R. Campbell and A. D. Roy. *Gut* 10(6):477-483, 1969.

Bovine trypsin and chymotrypsin were incubated with human gastric juice at 37C and in 2 hr there was an almost complete loss of activity. Bile was without effect on either enzyme, but 0.1 N HCl inactivated chymotrypsin by 38% after 2 hr. Autoincubation of homogenates of human ileostomy material resulted in a decrease of 37% in trypsin and 26% in chymotrypsin activity after 6 hr, but homogenates of ileal and jejunal epithelium were without effect on the bovine enzymes. The output of trypsin from subjects on ileal drainage was significantly reduced by neomycin sulphate but chymotrypsin output was unaffected. Calculation of Michaelis constants, activation energy, and pH optima gave good agreement between human trypsin of pancreatic and ileal sources, but discrepancies were noted with chymotrypsin. Added bovine pancreatic enzymes were completely recovered in 2 subjects given 100 mg of each by duodenal intubation. When 200 mg of each was given to 7 subjects the recovery of chymotrypsin averaged 38%, and trypsin output appeared to be suppressed. Absorption of enzymes could not be detected in 2 subjects. None of the bacteria harvested from ileal drainage had any effect on pancreatic enzyme activity or demonstrated any similar activity of their own.

3598 VITAMIN D-INDUCED CALCIUM-BINDING PROTEIN OF INTESTINAL MUCOSA. RELATION TO VITAMIN D DOSE LEVEL AND LAG PERIOD. *(E.)* Ebel, J. G. (New York State Vet. Coll., Cornell U., Ithaca), A. N. Taylor and R. H. Wasserman. *Amer J Clin Nutr* 22(4):431-436, 1969.

See also: 3465

GENERAL

3599 A NEW METHOD OF PRODUCING EXTERNAL PANCREATIC FISTULAS IN DOGS. *(Sp.)* Linares, C. A. (Ramos Mejia Hosp., Buenos Aires, Argentina) and C. J. L. Morel. *Rev Argent Cir* 13(1-2-3):9-10, 1967.

An experimental pancreatic fistula was produced in 3 dogs (20-25 kg body weight), so that pancreatic juice could be collected. The surgical procedure consisted of severing the main pancreatic duct at the duodenum and anastomosing it to an isolated colonic pouch connected to the exterior by a plastic tube. The secretion obtained (an average of 410 cm^3/day) had no activated enzymes, and the innervation and vascularization of the duodenum and pancreas were not disturbed. By adequately replacing (through diet) fluids and electrolytes, 2 of the 3 dogs survived for 20 and 25 postsurgical days, resp. The 3rd dog did not have fluid and electrolyte replacement, and died from dehydration and acidosis on the 8th postsurgical day.

3600 EXPERIMENTAL STUDY OF LIVER CIRCULATION IN HEMORRHAGIC SHOCK AND IN GANGLIOPLEGIC-INDUCED HYPOTENSION. *(Sp.)* Sanguinetti, F. A. (Surg. Clin., U. Munich, Germany), K. Messmer, K. Devens and W. Brendel. *Rev Argent Cir* 13(1-2-3): 31-33, 1967.

Liver circulation was studied in 53 dogs (20.5-38.5 kg body weight) by records of inflow and outflow on an electromagnetic flowmeter and an extracorporeal bypass. During hemorrhagic hypotension there is an apparent "autoregulation" of liver circulation (as long as the liver is intact, since in liver injury this regulatory mechanism is destroyed). This maintenance of liver circulation acts as protection against anoxia in the delicate liver parenchyma. Administration of the ganglioplegic trimethaphan did not disturb this regulation, thus proving that autoregulation of liver blood flow is not part of the nervous control of the liver.

3601 TIME OF ONSET OF ACTION OF CHOLERA TOXIN IN DOG AND RABBIT. *(E.)* McGonagle, T. J. (Johns Hopkins U. Sch. Med., Baltimore, Md.), H. A. Serebro, F. L. Iber, T. M. Bayless and T. R. Hendrix. *Gastroenterology* 57(1):5-8, 1969.

During perfusion of cholera exotoxin through intestinal segments of 16 white New Zealand rabbits and 10 dogs, it was shown that the exotoxin altered the direction of net fluid movement as early as 10 min after its contact with the intestinal mucosa. Gross fluid production (as manifested by dilution of phenolsulfon phthalein) did not become apparent until secretion exceeded absorption. The previously reported delay in the onset of fluid production in response to cholera exotoxin is more apparent than real.

3602 TREATMENT OF EXPERIMENTAL AMEBIASIS IN RATS WITH NIRIDAZOLE. *(Fr.)* Brumpt, L. and F. Ardoin. *Bull Soc Path Exot* 61(1):25-30, 1968.

The transplant from cecum of a strain of *Entamoeba histolytica* to cecum in 3 week old rats caused an experimental extremely virulent amebiasis which proved a useful model for a chemotherapeutic assay. Niridazole (Ciba 32,644 Be) a new derivative of nitrothiamidazole, was given p.o. (60 mg/kg body weight) the day after infestation for 4 days. On the 7th day the animals were sacrificed and microscopic studies of the cecum carried out. The presence or absence of *E. histolytica* was recorded on a 4-point scale. Of 230 rats inoculated, 95 of 115 untreated controls and 101 of the 115 treated animals were alive on day 7. Of the 95 surviving controls, 92 were carriers of ameba while 72 of the 101 treated rats were free of ameba. In 75% of the cases the results were good.

3603 HEMODYNAMICS OF ABDOMINAL ORGANS AFTER ENDOTOXIN INJECTION IN THE DOG. *(Ger.)* Messmer, K. (Surg. Clin., U. Munich, Germany), K. Wanner and H. J. Reulen. *Z Ges Exp Med* 146(3):292-308, 1968.

Experimental shock was produced in 21 dogs (29.7 kg) by the i.v. injection of *E. coli* endotoxin to study the circulatory changes in the communicating hepatic artery, the superior mesenteric artery, the renal and the femoral arteries. The changes were observed and recorded by an electromagnetic flowmeter. The three classic phases of shock were observed. The initial sharp decrease in arterial pressure can perhaps be explained by an acute sequestration of blood caused by a block of blood flowing from the liver. The pressure flow relationships plotted on graphs were convex toward the abscissa for the hepatic, the superior mesenteric, and the renal arteries. This suggests that in these regions self regulation of blood flow does not occur as it does in rapid experimental hemorrhage. Experiments in 3 dogs in which the head and body circulations were completely isolated support the hypothesis that endotoxin alters blood vessel reactivity through an as-yet-unknown mechanism, possibly through an indirect action upon smooth muscle by mediator substances (e.g. histamine, serotonin, catecholamine).

3604 EXPERIMENTAL CHOLEDOCHO-CHOLECYSTITIS OF DUODENAL ORIGIN. *(It.)* Berti-Riboli, E. (Inst. Clin. Chir., U. Genoa, Italy), A. Gramegna, F. Molfino and G. B. Gemma. *Chir Pat Sper* 16(4):302-315, 1968.

Duodenal hypertension, duodenal hypertension with atony of the choledochal sphincters, hyperkinesia and hyperkinesia with atony of the choledochal sphincters were induced in 26 dogs. In dogs with duodenal hypertension with atony of the choledochal sphincter, and in dogs with hyperkinesia with atony of the choledochal sphincter, histological examination of the biliary duct and gallbladder showed parvicellular infiltrations at the mucosa level, desquamated epithelium, and abundant corpuscular secretion. In some instances, the fibromuscular wall was thickened. In dogs with simple duodenal hypertension or hyperkinesia there were no histopathological changes. Duodenal hypertension can cause disease of the choledochus and gallbladder of varying seriousness when associated with sphincteral atony even though the pathological changes are less frequent and less serious than those in the pancreas.

3605 CHANGES IN THE ARTERIAL HEPATIC BLOOD SUPPLY DURING HEMORRHAGIC SHOCK. *(It.)* Cortesini, C. (Inst. Spec. Surg. Pathol., U.

Florence, Italy), R. Franciai, A. Pirani, E. Pagni and G. P. Novelli. *Osped Ital Chir* 17(2):129-140, 1967.

3606 **INOCULATION OF THE DIGESTIVE TRACTS OF GERM-FREE MICE WITH 12 BACTERIAL STRAINS. I. A KINETIC STUDY OF IMPLANTATION AND EQUILIBRIUM OBTAINED IN THE FECES OF "GNOTOXENIC" MICE.** *(Fr.)* Ducluzeau, R. (Inst. Sci. Cancer Res., Villejuif, France) and P. Raibaud. *Ann Inst Pasteur (Paris)* 116(3):345-369, 1969.

3607 **INOCULATION OF THE DIGESTIVE TRACTS OF GERM-FREE MICE WITH 12 BACTERIAL STRAINS. II. EQUILIBRIUM OBTAINED AMONG THE STRAINS IN VARIOUS SEGMENTS OF THE DIGESTIVE TRACT.** *(Fr.)* Ducluzeau, R. (Inst. Sci. Cancer Res., Villejuif, France) and P. Raibaud. *Ann Inst Pasteur (Paris)* 116(3):370-382, 1969.

See also: 4169

DIAGNOSTIC PROCEDURES

3608 VITAMIN K TOLERANCE TEST IN CHRONIC HEPATITIS. *(It.)* Barlattini, M. (Inst. Med. Ther., U. Rome, Italy) and V. Rosica. *Epatologia* 14(1):9-38, 1968.

The literature on the relationship between coagulation and vitamin K is reviewed. A liver function test based on the i.v. injection of 30 mg vitamin K daily for 3 consecutive days was evaluated. Prothrombin time (PT), recalcification time (RT) and thromboelastogram index (TEI) were determined in 15 cirrhotic patients (37.5% with precirrhosis, 37.5% with compensated cirrhosis, 25% with uncompensated cirrhosis). Each case is described in detail. These determinations, after vitamin K administration, showed a significant reduction of PT, RT and TEI in 40% of the patients, no modification in 20%, and an increase in 40%. After 40-60 days of therapy, PT, RT and TEI were lowered in 46%, unchanged in 8% and increased in 46%. This vitamin K tolerance test gives information on the functional capacity of the hepatocyte and, if repeated several times during the course of the disease, is useful in prognosis.

3609 OUR EXPERIENCE WITH CHOLANGIOGRAPHY DURING SURGERY. *(It.)* Ciucci, O. (S. Giovanni Battista Hosp., Foligno, Italy) and R. Giombolini. *Osped Ital Chir* 18(4):349-362, 1968.

In the last 7 yr cholangiography was carried out in 323 patients during surgical intervention. The technique was extremely useful in cases of cholecystolithiasis (214), hepatocholedocholithiasis (33), papillitis (21), nontumoral pancreopathies (16) and tumors of the pancreas and biliary tract (11). Fourteen examples of the various pathological states are given together with illustrative X-ray findings.

3610 SCINTILLATION SCANNING IN THE STUDY OF METASTASES OF GASTROINTESTINAL NEOPLASMS. *(It.)* Veroux, G. (Inst. Clin. Gen. Surg., U. Catania, Italy), N. Alberti, P. Azzolina, E. Cirino and O. Ippolito. *Chir Pat Sper* 16(4):353-370, 1968.

Hepatic scintillation scanning, using radioactive gold, was carried out in 170 patients with tumors of the esophagocardial junction (25), stomach (62), small intestine (6), colon and sigma (3), rectum (25), gallbladder (6), and pancreas (14). During operation or at autopsy, in 68 (40%) hepatic metastases were found. Of the 68, only 24 (30%) had been suspected on the basis of the clinical data, laboratory studies and radiology findings; in 62 (92%) the presence of liver metastases had been shown by scintillation scanning before surgery. There were 2 false positive and 2 false negative results. Scintillation scanning is an extremely useful tool in the search for possible hepatic metastases arising from tumors of the alimentary tract.

3611 CHOLECYSTOCHOLANGIOGRAPHY USING A DOUBLE DOSE OF CONTRAST MEDIUM AND CHOLECYSTOCHOLANGIOGRAPHY BY DRIP INFUSION WITH PHYSIOLOGICAL SOLUTION. *(It.)* Caresano, A. (Ospedale Circolo Varese, Italy) and R. Crespi Porro. *Acta Chir Ital* 24(4):409-429, 1968.

Of 70 patients with hepatobiliary diseases, 40 were given 40 ml Bilivistarin in 210 ml physiologic saline, by drip perfusion for 60 min, and 30 were given two doses of 20 ml Bilivistarin with an interval of 30 min between injections. Good visualization in cholecystocholangiography by drip infusion and by the injection twice, was obtained in 66% and 30%, resp., in the liver; in 92% and 63%, resp., in the hepatic duct; in 75% and 47%, resp., in the gallbladder. No side effects were observed.

3612 HEPATIC CLEARANCE OF BROMOSULFOPHTHALEIN (BSP) IN JAUNDICE. *(Sp.)* Rodes, J. (Fac. Med., Barcelona, Spain), M. Bruguera, J. M. Bordas and J. Teres. *Rev Esp Enferm Apar Dig* 28(1):57-92, 1969.

Bromosulfophthalein (BSP) clearance was determined on 9 patients with no hepatobiliary disease and 79 patients with various forms of jaundice (33 with cirrhosis, 4 with biliary cirrhosis, 7 with acute hepatitis, 5 with extrahepatic obstructive jaundice due to biliary lithiasis, 12 with acute cholestatic hepatitis, 15 with extrahepatic obstructive jaundice caused by neoplasms of the head of the pancreas or biliary tract, and 3 patients with Dubin-Johnson's syndrome). In 33 patients with hepatic cirrhosis and jaundice there was a parallelism between increased conjugated bilirubin, increased alkaline phosphatase levels, and BSP retention of more than 15% at 45 min. In 4 patients with secondary biliary cirrhosis the clearance values were particularly low since damaged hepatocytes had difficulty taking up the dye and it passed through the biliary tract with difficulty because of obstructions. In 7 patients with acute hepatitis, BSP retention ranged from 10.3-48.8% at 45 min; alkaline phosphatase activity was normal; SGPT and bilirubin values were elevated in all cases. In 4 of 5 patients with extrahepatic obstructive jaundice caused by biliary lithiasis, BSP retention at 45 min was normal, but the clearance values were the highest of any group.

3613 A NEW HEMOCOAGULATION TEST IN EVALUATION OF SLIGHT DEFICIENCIES OF LIVE FUNCTION. *(It.)* Coccheri, S. (Inst. Work Med., U. Bologna, Italy), M. Alessandri, P. Fiorentini and G. B. Raffi. *Fegato* 14(3):421-431, 1968.

In 102 hepatopathic patients Owren's Normotest was used to give evidence of a slight deficit of vitamin K-dependent hemocoagulation factors. In 28 subjects with severe hepatopathy (cirrhosis and infectious hepatitis), Normotest was positive in 60.7%, Quick's test in 39.3%, Hicks and Pitney's test in 42.9% for both the t_r and tmx parameters. In 21 patients with progressed infectious hepatitis, a positive Normotest was found in 42.9%, Quick's test in 23.8%, a positive t_r parameter of Hicks and Pitney's test in 68.8% and tmx parameter in 31.3%. In 53 patients with moderate hepatic insufficiency, Normotest was positive in 37.7%, Quick's test in 24.5%, t_r in 51.6% and tmx in 25.8%.

3614 DOUBLE-CONTRAST METHOD FOR EVALUATION OF GASTRIC LESIONS. *(E.)* Solanke, T. F. (Cancer Inst. Hosp., Tokyo, Japan), K. Kumakura, M. Maruyama and N. Someya. *Gut* 10(6):436-442, 1969.

A double contrast method for radiological examination of the stomach is described. It was proven helpful in the diagnosis of adenocarcinoma (4), ulcerative disease (2) and polyp of the stomach (1). A barium suspension along with air insufflation is used to obtain better gastric delineation during upright, supine and oblique fluoroscopic examinations. Compression studies are taken and if an anterior wall lesion is suspected, prone views are obtained.

3615 **LABORATORY DIAGNOSIS OF SPECIFIC ORGAN DISEASES BY MEANS OF COMBINED SERUM ISOENZYME PATTERNS.** *(E.)* Nerenberg, S. T. (Child. Hosp., San Francisco, Calif.) and G. Pogojeff. *Amer J Clin Path* 51(4):429-439, 1969.

A method is described of using combined serum alkaline phosphatase, lactic dehydrogenase (LDH), and occasionally, creatine phosphokinase isoenzyme patterns to improve the specificity of enzyme studies in pinpointing diseased organs (or altered physiologic states, such as pregnancy) in patients. The improved specificity is due to the difference in alkaline phosphatase isoenzyme patterns in those organs or tissues having similar LDH isoenzyme patterns (heart, kidneys, brain, red blood cells, etc.). In addition, a method using simple equipment and capable of routinely screening all admissions to a hospital for unsuspected major illnesses (using the combined isoenzyme technique) is described. Approximately 25% of routine sera received in a hospital laboratory were found to be abnormal. Unsuspected cases of myocardial infarction, renal disease, hepatitis, and others were found. Approximately 15% of the total number of cases of myocardial infarction were found to be associated with normal total serum LDH levels but had characteristic abnormal isoenzyme patterns. Approximately 44% of cord sera of newborns and sera of postpartum mothers were found to harbor elevated LDH_4 or LDH_5, or both. The possibility that these isoenzymes were derived from secretions of amnion was suggested by extract studies of the latter tissues.

3616 **THE SIGNIFICANCE OF THE ACIDIC AND PEPTIC CONSTITUENT RATIO OF GASTRIC SECRETION. (BONFILS' K_{25} COEFFICIENT).** *(Ger.)* Pelikán, V. (3rd U. Med. Clin., Olomouc, Czechoslovakia), V. Horčička, P. Vrublovsky, O. Weinbergová and Č. Čihalík. *Deutsch Z Verdau Stoffwechselkr* 28(5/6):289-294, 1968.

Acid output was measured in 23 duodenal ulcer patients and 15 normal controls (males ages 18-24). Bonfil's K_{25} coefficient was calculated using these findings. In contrast to HCl secretion, pepsin secretion is primarily dependent upon vagus stimulation. The correlation between the two is expressed as the coefficient K_{25}, which was verified in the present experiment. Two responses of duodenal ulcer patients were observed: first were those with basic high HCl secretion and resultant low K_{25} values, probably due to the increased gastrin formation and increased gastrin elimination resulting from increased vagus stimulation. The high K_{25} values and the low basic liberation of HCl in the other group seem to point to a preponderance of the vagus mechanism.

3617 **RADIOACTIVE COLLOIDAL GOLD CLEARANCE FOR THE EVALUATION OF LIVER CIRCULATION IN CHRONIC INFLAMMATORY LIVER DISEASES.** *(Fr.)* Marculesco, L. (Ctr. Gastroent., Bucharest, Romania), G. Jovin, O. Hoanca and B. Gheorghesco. *Rev Roum Med Intern* 5(4):231-243, 1968.

The 39 patients studied with colloidal ^{198}Au included: 5 cases of residual chronic hepatitis, 12 cases of persistent chronic hepatitis, 14 cases of compensated hepatic cirrhosis, and 8 of decompensated hepatic cirrhosis. There was a satisfactory agreement in the findings on hepatic circulation shown by the use of ^{198}Au and other methods. ^{198}Au is useful in the differential diagnosis of liver diseases when combined with other clinical and biological studies.

3618 **ECHO DUODENOGRAPHY (ULTRASOUND DUODENOGRAPHY). PRELIMINARY OBSERVATIONS.** *(It.)* Labó, G. (Inst. Spec. Med. Path., U. Bologna, Italy), T. Posteli, G. Gasbarrini, A. Corinaldesi and E. Roda. *Arch Ital Mal Appar Dig* 35(2):123-129, 1968.

Patterns of echograms of a section (about 2 cm) of duodenum, using ultrasound produced by the Eskoline 20-Kline Smith apparatus, were obtained in 4 normal subjects during 4 sec. Roentgenocinematography was synchronized as a control. Ultrasound duodenography obtained a good definition of the anterior and posterior wall of the duodenum. After administration of barium sulfate and after atropine the duodenum appeared dilated; after prostigmine, metoclopramide and during segmental motility it appeared contracted.

3619 **BROMSULPHTHALEIN FRACTIONAL CLEARANCE IN NORMAL BEEF CATTLE.** *(E.)* Hunt, S. E. (Dept. Clin. Studies, Vet. Sch., U. Queensland, Australia) and P. J. McCosker. *Clin Chim Acta* 18(1):133-140, 1967.

3620 **QUANTITATIVE DETERMINATION OF BILIRUBIN PIGMENTS IN URINE.** *(E.)* Weber, A. P. (Munic. Hosp., Arnhem, Netherlands) and E. D. A. Sindram. *Clin Chim Acta* 18(1):169-174, 1967.

3621 **AN ULTRAMICRO METHOD FOR THE FLUOROMETRIC DETERMINATION OF LEUCINE AMINOPEPTIDASE IN SERUM.** *(E.)* Rockerbie, R. A. (Dept. Clin. Biochem., Regina Grey Nuns' Hosp., Saskatchewan, Canada) and K. L. Rasmussen. *Clin Chim Acta* 18(1):183-185, 1967.

3622 **UNUSUAL BAND ON STARCH GEL ELECTROPHORESIS OF SERA FROM PATIENTS WITH CIRRHOSIS OF THE LIVER.** *(E.)* Hoenigová, J. (First Dept. Intern. Med., Charles U., Prague, Czechoslovakia) and V. Hoenig. *Clin Chim Acta* 18(1):313-314, 1967.

3623 **CONTRIBUTION TO RADIOLOGICAL DIAGNOSIS OF CHOLEPERITONEUM WITH PLAIN RADIOGRAPHY OF THE ABDOMEN.** *(It.)* Frassineti, A. (Castelfranco Emilia, Italy), C. Putti, R. Sciascia and G. Voltolini. *Osped Ital Chir* 17(6):693-712, 1967.

3624 **THE EXAMINATION OF THE COLON WITH THE APPLICATION OF DOUBLE CONTRAST MEDIUM AND SPECIAL APPARATUS.** *(Pol.)* Dzurak, W. (2nd Cent. Clin. Hosp., Warsaw Acad. Med., Poland). *Pol Przegl Radiol* 31(6):857-865, 1967.

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3723 **FIBEROPTIC DUODENOSCOPY.** *(E.)* Takagi, T. (Fac. Med., U. Tokyo, Japan), T. Go, M. Sugiura, S. Futagawa and R. Hioki. *Surgery* 65(4):597-602, 1969.

3724 **RADIOLOGY OF THE NORMAL ESOPHAGOCARDIAL REGION.** *(Fr.)* Dehouve, A. (Dept. Radiol., Hotel Dieu, Paris, France) and J. Boisson. *Actualites Hepatogastroent Hotel Dieu* 5(1):A14-A33, 1969.

3725 **ENDOSCOPIC EXPLORATION OF THE NORMAL ESOPHAGOCARDIAL REGION.** *(Fr.)* Debray, C. (Bichat Hosp., Paris, France) and P. Housset. *Actualites Hepatogastroent Hotel Dieu* 5(1):A34-A40, 1969.

3726 **REMARKS ON CERTAIN ASPECTS OF THE RADIOLOGICAL EXPLORATION OF THE ESOPHAGOGASTRIC JUNCTION.** *(Fr.)* Brombart, M. *Actualites Hepatogastroent Hotel Dieu* 5(1):A41-A44, 1969.

3727 **NEW TECHNIQUES FOR ACCURATE DIAGNOSIS AND MANAGEMENT OF HIATAL HERNIA AND GASTROESOPHAGEAL REFLUX.** *(E.)* Hookman, P. (George Washington U. Sch. Med., D. C.). *Med Ann* 38(5):243-248, 1969.

3728 **ESOPHAGOSCOPIC CINEMATOGRAPHY AND BIOPSY THROUGH A NEW FIBEROPTIC INSET ADAPTED TO THE HUFFORD ESOPHAGOSCOPE.** *(E.)* Beck, I. T. (Dept. Med., Queen's U., Kingston, Ont., Canada) and E. Phelps. *Gastroint Endosc* 15(4):195-197, 1969.

See also: 3459,3468,3497,3518,3593,3786,3795,3799,3864,3865,3962,3975,3977,3986,4060,4064,4074,4080,4081,4086, 4089,4092,4094,4096,4115,4117,4122,4135,4137,4139,4175,4176,4177,4181,4183,4184,4185,4187,4250

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GASTROINTESTINAL DISEASES

ESOPHAGUS

3729 **ANATOMO-SURGICAL STUDY OF THE RETROSTERNAL SPACE FOR ESOPHAGO-COLONPLASTY.** *(It.)* Dei Poli, G. (Inst. Surg. Anat., U. Turin, Italy), R. Weisz, P. A. Rosso and M. Dei Poli. *Minerva Chir* 23(5):240-248, 1968.

On the basis of 23 autopsies of retrosternal spaces, a surgical method is presented for the creation of an adequate retrosternal tunnel. A hiatus between peritoneal cavity and the anterior mediastinum at the level of the chondrosternal fasciculi of the diaphragm represents the starting point. The prepericardial space is opened from the inferior interpleural triangle and the inferior and superior ligamenta sternopericardiaca interrupted. At the thymus level the cervical esophagus is prepared for anastomosis with the dislocated intestinal ansa.

3730 **MEGAESOPHAGUS: CLINICAL, RADIOLOGICAL AND ENDOSCOPIC ASPECTS.** *(Sp.)* Sanz Jimenez, M. (Carlos J. Bello Hosp., Caracas, Venezuela), T. Landaeta and K. Hoyer. *GEN* 23(1):105-110, 1968.

Among 100,000 surgical reports and medical histories there were 16 cases of megaesophagus (10 or 62.5% in males and 6 or 37.5% in females). Racial distribution was: Caucasian, 4 (25%), mixed, 11 (68.7%) and Negro, 1 (6.2%). The age range was 11-90 with 6 (37.5%) falling between 31 and 40. Five (31.2%) sought medical assistance within 1 yr after onset of symptoms, 2 (12.5%) within 2 yr of onset, and 2 (12.5%) within 3 yr. Three waited as long as 9-11 yr before seeking medical aid. Dysphagia was the most important symptom (100% of the cases), followed by regurgitation (68.7%), weight loss (56.2%), sialorrhea (50%) and belching and vomiting (31%). Radiological studies indicated dilatation in all, decrease in the diameter of the lower third of the esophagus (75%) and delay in emptying (43.7%). Endoscopy was carried out in 7 cases and revealed dilatation in 85.7% and congestion in 42.8%. Eight of the 11 cases treated by drugs, and 4 of the 5 cases treated surgically had satisfactory results.

3731 **ESOPHAGOPLASTY BY THE TRANSVERSE COLON IN CASES OF ESOPHAGEAL STENOSIS CAUSED BY ALKALI INGESTION.** *(Fr.)* Krisar, Z. (Oradea Hosp., Romania), L. Kotsis, A. Dobjanschi, M. Monosi and T. Abrudan. *Bull Soc Int Chir* 27(6):650-655, 1968.

Esophagoplasty using the transverse colon was performed on 20 patients (19 females and 1 male; 6-45 yr old) with cicatricial stricture of the esophagus. In 11 patients who were in good general condition the procedure was carried out in one stage, without preliminary gastrostomy; in 2 gastrostomy and the esophagoplasty were performed at the same time; and in 7 gastrostomy was carried out later. There was a positive result in 15 patients (recovery without complications) and 1 death due to peritonitis. The one-stage procedure reduced the period of hospitalization to an average of 3-4 weeks. Suprastrictural syndrome was a complication observed in 3 patients after 4-32 months.

3732 **BENIGN TUMORS OF THE ESOPHAGUS.** *(E.)* Pawlicka, L. (Dept. Radiology, Inst. Tuberculosis, Warsaw, Poland). *Pol Rev Radiol Nuclear Med* 32(4):409-415, 1968.

Histologic and nonspecific radiologic evidence is presented in 5 cases of benign esophageal neoplasms (4 leiomyomas, 1 fibroma). One of the tumors was located in the upper, 1 in the middle and 3 in the lower part of the esophagus. Symptoms were variable and included dysphagia, and retrosternal and abdominal pains.

3733 **A CLINICOSTATISTICAL REVIEW OF 78 ESOPHAGEAL CANCERS SUBJECTED TO TELECOBALT THERAPY.** *(It.)* Guzzon, A. (Natl. Cancer Inst., Milan, Italy), F. Milani and F. Volterrani. *Tumori* 54(2):161-174, 1968.

Telecobalt therapy was administered to 78 patients (72 males and 6 females; aged 40-82 yr) with inoperable esophageal cancers. The extent of the tumor was $<$ 5 cm in 17 (22.7%); 5-10 cm in 42 (53.1%); $>$ 10 cm in 19 (24.2%). The doses administered were $<$ 6000 r in 25 patients (32.1%); 5000-6000 r in 30 (38.5%); 4000-5000 r in 23 (29.4%), for a period of 60-90 days. The immediate results were positive in 57 (73.1%); slightly positive in 15 (19.2%); negative in 6 (7.7%); 5 months after therapy 50% were dead. After 1 yr 23 patients survived (6 for 2 yr, 1 for 3 yr; 1 for 4 yr, 4 months). The average survival was 11 months for patients 70-80 yr old, 9 months for those 60-70 yr old, 8 months for those 50-60 yr old, 7 months for those 40-50 yr old, and more than 11 months for the 6 females. For tumors up to 5 cm the average life expectancy was 13.1 months, for those larger than 10 cm it was 8.2 months. The average survival in the patients irradiated with more than 6000 r was 11.1 months, with 5000-6000 r was 9 months, with 4000-5000 r was 8.1 months. The optimum dose seems to be about 6000 r during 60 days.

3734 **TRANSMURAL POTENTIAL DIFFERENCE IN PATIENTS WITH HIATUS HERNIA AND OESOPHAGEAL ULCER.** *(E.)* Beck, I. T. (Hotel Dieu Hosp., Kingston, Ontario, Canada) and N. A. Hernandez. *Gut* 10(6): 469-476, 1969.

Using a constant infusion method, transmural potential difference was investigated in patients with hiatus hernia (14) and ulcers of the esophagus (10). The potential difference transition zone from negative to positive at the esophagogastric junction in patients with hiatus hernia was compared to normal. The transition zone was increased in length and proximally dislocated in patients with hiatus hernia. A fall in potential difference was observed over mucosal ulceration of the body of the esophagus using the constant infusion technique. This latter was confirmed by measuring the potential difference during esophagoscopy.

3735 **THE EMERGENCY MANAGEMENT OF BLEEDING OESOPHAGEAL VARICES WITH SCLEROSING INJECTIONS.** *(E.)* Hunt, P. S. (Queen's U. Belfast, Ireland), G. W. Johnston and H. W. Rodgers. *Brit J Surg* 56(4):305-307, 1969.

During a 10 yr period 53 patients with bleeding esophageal varices were treated with 101 sclerosing injections (3-5 cc of ethylolamine oleate in each varix). The causes of the varices were cirrhosis and portal hypertension (32 patients, average

age 54) portal vein thrombosis and portal hypertension (20 patients, average age 14) and indeterminate, but not cirrhosis or extrahepatic block, (1). The bleeding was controlled by the sclerosant in all but 1 of the patients with portal vein thrombosis. There were 2 esophageal perforations in this group. The average time of relief from bleeding was 18 months. One patient died as a result of the breakdown of an esophagocolonic anastomosis, and 2 others died in the hospital of causes unrelated to the procedure. Nine (28%) of the patients with hepatic cirrhosis failed to leave the hospital but the mortality rate per course of injections was only 15%. The sclerosant failed to halt bleeding 7 times in a total of 44 injections. The average time before further hemorrhage was 6 months in those patients not subjected to a portacaval shunt. Patients with a low albumin and a high bilirubin had a higher mortality rate.

3736 JEJUNAL AND COLONIC INTERPOSITION FOR NON-MALIGNANT DISEASE OF THE ESOPHAGUS. *(E.)* Ferrer, J. M. (Columbia Presbyterian Med. Ctr., New York, N. Y.) and H. M. Bruck. *Ann Surg* 169(4): 533-543, 1969.

During the 20-yr period 1946-1966, 40 esophageal replacement operations were performed in 39 children and adults for non-malignant disease of the esophagus, excluding varices. The operative mortality was 20%. Of the 31 survivors, 27 had good or satisfactory results. The jejunum functioned better physiologically than the colon as an esophageal replacement, as was established by clinical cineradiographic studies to conclude jejunal interposition is therefore the better operation. Colon may be transplanted with satisfactory results if the jejunal mesentery is too short or under too much tension. Operation should be staged in with esophageal replacement deferred until the infant is at least 2½ yr old and weighing 20 pounds.

3737 DYSPHAGIA, ESOPHAGITIS, AND HIATUS HERNIA. *(E.)* Johnston, D. H. (Lexington Clinic, Kentucky). *Gastroent Endosc* 15(4):220-223, 1969.

Twenty-eight patients with symptomatic hiatus hernias were investigated by esophagoscopy and multiple biopsies of the lower esophagus, esophago-gastric junction, and cardiac portion of the stomach. Five of 12 patients with demonstrated ulcerative esophagitis had dysphagia as compared to 12 of 16 patients without esophagitis. Six of the 12 esophagitis patients had experienced ulcer-like high epigastric pain and 3 had atypical, painful swallowing. Gross observations of the esophageal and junctional mucosa at esophagoscopy were not reliable in diagnosing esophagitis; therefore, biopsy is needed to establish a definite diagnosis.

3738 SURGICAL MANAGEMENT OF BLEEDING GASTROESOPHAGEAL VARICES IN CHILDREN. *(E.)* Tank, E. S. (U. Michigan Med. Ctr., Ann Arbor), V. W. Wallin, J. G. Turcotte and C. G. Child III. *Arch Surg (Chicago)* 98(4):451-456, 1969.

Twenty-three children underwent 29 operative procedures during an 8 yr period to arrest bleeding from esophageal varices. Portal hypertension was due to portal vein thrombosis (12), portal vein stenosis (1), congenital hepatic fibrosis (4), post-necrotic cirrhosis (2), biliary atresia (1), mucoviscidosis (1), Gaucher's disease (1), and hepatic vein obstruction (1). A potential etiologic factor was apparent in only 5 of the cases of extrahepatic obstruction. Children with extrahepatic obstruction experienced their first hemorrhage at an earlier age (6 yr vs. 10 yr for congenital hepatic fibrosis and 8 yr for the others), had more episodes of hemorrhage, a greater interval before definitive portal decompression was accomplished, and had more unsuccessful attempts to control bleeding (7 vs. none for the others). Varices were visualized by 13 of 16 barium esophagograms. Operative portograms were used to assess patency and the caliber of portal and mesenteric vessels. Definitive operations for extrahepatic portal obstruction included mesocaval shunts (10), splenorenal shunts (2) and colonic interposition (1). There were no operative deaths, the mean survival time was 30 months and complications were limited to transient lower extremity edema, an episode of phlebitis, and a stricture of the esophagocolonic junction. The 4 congenital hepatic fibrosis patients were alive a mean of 32 months after mesocaval (1) and portacaval (3) shunts. There was 1 episode of transient edema of the lower extremities. The other 5 patients died from 4 to 38 months after surgery of hepatic failure (3), respiratory failure (1), and hepatoma (1).

3739 GASTROESOPHAGEAL HYPERCONTRACTING SPHINCTER. MANOMETRIC AND CLINICAL CHARACTERISTICS. *(E.)* Garrett, M. J. (U. Alabama Med. Ctr., Birmingham) and D. H. Godwin. *JAMA* 208(6):992-998, 1969.

Studies of 11 of 381 patients who underwent diagnostic esophageal-motility tests are described. The 11 patients (6 males and 5 females, 10-76 yr old) had a hypercontracting gastroesophageal sphincter. Motility disturbances included: prolonged and powerful contractions of the sphincter in all 11 patients; esophageal motor incoordination and diffuse spasm in 2 patients; hiatal hernia pressure changes in 6 patients. Contractions were measured manometrically and compared to those obtained in a control group of 10 healthy males, 20-74 yr old). Prominent gastrointestinal-tract complaints were substernal pain, at times considered to be of cardiac origin, and dysphagia in 9 patients; 2 patients were asymptomatic. Usual medical management of hiatal hernia was generally effective. Incapaciting pain in 2 patients prompted the decision to perform esophagotomy which provided excellent relief of symptoms. It is suggested that in patients with unexplained chest pains the possibility of a hypercontracting gastroesophageal sphincter be considered. Diagnosis is made only by manometry.

3740 FOLLOW-UP RESULTS IN SURGICAL TREATMENT OF 42 CASES OF HIATUS GASTRIC HERNIA. *(It.)* Mazzoni, G. (Vittorio Emanuele III Hosp., Valmontone, Italy) and A. Demofonti. *Clin Europ* 7(6):840-842, 1968.

Surgical treatment of hiatus hernia was performed transabdominally in 42 patients. At follow-up there was complete recovery in 35 (83%), in 1 patient (2.3%) relapse was demonstrated radiologically and in 6 patients (14%) anginal pain or dyspepsia remained.

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3741 METASTASES OF ESOPHAGEAL AND CARDIAL CANCER. *(Ger.)* Szabó, L. E. (Surg. Clin., Budapest Med. U., Hungary), S. Karácsonyi and E. Füredi. *Acta Chir Acad Sci Hung* 8(4):301-308, 1967.

3742 THE USE OF THE GOUREVITCH TUBE IN UNRESECTABLE STRICTURES OF THE OESOPHAGUS. *(E.)* Macarthur, A. (St. Helier Hosp., Carchalton, Surrey, England) and J. L. Mercer. *Thorax* 24(1):39-42, 1969.

3743 MASSIVE HEMORRHAGE FOLLOWING PNEUMATIC DILATION OF THE ESOPHAGUS IN ACHALASIA. *(E.)* Morowitz, D. A. (Dept. Med., U. Chicago, Ill.), W. Satterlee and J. B. Kisner. *Gastroint Endosc* 15(4):215-217, 1969.

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3745 COMPARATIVE EVALUATION OF MOTILITY STUDIES IN THE DIAGNOSIS OF ESOPHAGEAL DISEASE. [EDITORIAL.] *(E.)* Code, C. F. (Mayo Clin., Rochester, Minn.). *Gastroenterology* 56(4):798-801, 1969.

3746 RADIOLOGY OF ESOPHAGEAL PEPTIC STENOSIS IN THE ADULT (13 CASES OF PEPTIC ESOPHAGITIS AND 8 OF CANCER). *(Fr.)* Bret, P. (Ed. Herriot Hosp., Lyon, France), R. Brette, M. Croisille and Servonnat. *Ann Radiol (Paris)* 10(5/6):361-372, 1967.

3747 BENIGN ESOPHAGEAL TUMOR: CASE REPORT WITH ENDOSCOPIC REMOVAL ASSOCIATED WITH A ZENKER DIVERTICULUM. *(E.)* Weaver, D. S. (Sutter Mem. Hosp., Sacramento, Calif.) and E. E. Johnson. *Gastroint Endosc* 14(2):124-126, 1967.

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3750 SECONDARY DYSPLASTIC DIVERTICULUM OF THE ESOPHAGUS. *(It.)* Romanelli, R. (Inst. Anat. Pathol. Histol., U. Genoa, Italy) and C. Guiddi. *Rass Arch Chir* 5(6-bis):498-508, 1967.

3751 TREATMENT OF CONGENITAL ESOPHAGEAL STENOSIS. *(Rus.)* Vakhidov, V. V. (Tashkent Med. Inst., USSR). *Grudn Khir* 10(4):93-95, 1968.

3752 DUPLICATIONS OF THE CERVICAL ESOPHAGUS IN INFANTS AND CHILDREN. *(E.)* Gans, S. L. (Cedars-Sinai Med. Ctr., Los Angeles, Calif.), D. A. Lackey and L. Zuckerbraun. *Surgery* 63(5):849-852, 1968.

3753 SQUAMOUS CARCINOMA OF THE ESOPHAGUS. *(E.)* Moseley, R. V. (Peter Bent Brigham Hosp., Boston, Mass.). *Surg Gynec Obstet* 126(6):1242-1246, 1968.

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3756 PROTECTION OF INTRATHORACIC ESOPHAGEAL ANASTOMOSES BY OMENTUM. *(E.)* Goldsmith, H. S. (Sloan-Kettering Inst., New York, N. Y.), A. A. Kiely and H. T. Randall. *Surgery* 63(3):464-466, 1968.

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3760 A CASE OF BILATERAL PARASTERNAL DIAPHRAGM HERNIA. *(It.)* Grosso, G. (Civil Hosp., Genoa, Italy). *Rass Arch Chir* 6(2):70-80, 1968.

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3762 TOTAL ESOPHAGEAL REPLACEMENT BY THE LEFT COLON USING THE RETROSTERNAL ROUTE. *(Jap.)* Shikata, T. (Kyoto Prefectural U. Med., Japan) and M. Shimizu. *Jap J Thorac Surg* 21(3):176-182, 1968.

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3768 **DIAPHRAGMATIC HERNIAS AS A CAUSE OF GASTROINTESTINAL BLEEDING.** *(Sp.)* Perez Bracamonte, R. ("Nuestra Señora de la Salud" Soc. Welfare Sanitorium, Toledo, Spain). *Rev Esp Enferm Apar Dig* 27(2):281-283, 1968.

3769 **DYSPHAGIA: ITS DIAGNOSTIC SIGNIFICANCE.** *(Ger.)* Nissen, R. (Surg. Clin., U. Basel, Switzerland). *Munchen Med Wschr* 110(29):1687-1689, 1968.

3770 **CRITERIA FOR RESECTABILITY OF THE ESOPHAGUS IN CANCER.** *(Rus.)* Napalkov, P. N. (Leningrad Inst. Sanit. Hyg. Med., USSR) and A. U. Krasner. *Grudn Khir* 10(3):129-132, 1968.

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3772 **TORSION SPASMS AND ABNORMAL POSTURES IN CHILDREN WITH HIATUS HERNIA. SANDIFER'S SYNDROME.** *(E.)* Sutcliffe, J. (Hosp. Sick Child., London, England). Pp. 190-197 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3773 **A SPECIAL FORM OF DISTURBED SWALLOWING. ONE ASPECT OF FAMILIAL DYSAUTONOMIA.** *(E.)* Harris, G. B. C. (Harvard Med. Sch., Boston, Mass.). Pp. 184-189 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3774 **TRACHEO-ESOPHAGEAL FISTULA WITH AND WITHOUT ESOPHAGEAL ATRESIA–SPECIAL ASPECTS.** *(E.)* Gwinn, J. L. (Child. Hosp., Los Angeles, Calif.). Pp. 170-183 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3775 **NORMAL AND DISTURBED SWALLOWING.** *(E.)* Ardran, G. M. (United Oxford Hosp., England) and F. H. Kemp. Pp. 151-169 in *Progress in Pediatric Radiology*, Vol. 2, Kaufmann, H. J. Ed. Basel, Karger, 1969. 404 pp.

3776 **MEDIASTINITIS CAUSED BY ESOPHAGEAL PERFORATION IN INFANTS AND CHILDREN.** *(Ger.)* Wurnig, P. (St. Anna Pediat. Hosp., Vienna, Austria) and P. Krepler. *Wien Klin Wschr* 81(7):114-116, 1969.

3777 **MEGA-ESOPHAGUS.** *(Fr.)* Boutelier, P. *Concours Med* 91(7):1297-1304, 1969.

3778 **COLON INTERPOSITION FOR PALLIATION OF MALIGNANT ESOPHAGOTRACHEAL FISTULA.** *(E.)* Maunz, D. L. (VA Hosp., White River Junction, Vermont) and W. B. Crandell. *Amer J Surg* 117(4): 599-602, 1969.

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3780 **NONINSTRUMENTAL PERFORATIONS OF THE ESOPHAGUS.** *(E.)* Wychulis, A. R. (Mayo Clin., Rochester, Minn.), R. S. Fontana and W. S. Payne. *Dis Chest* 55(3):190-196, 1969.

3781 **CHEMICAL BURNS OF THE ESOPHAGUS AND STOMACH.** *(Rus.)* Fishchenko, A. Ia. (N. I. Pirogov Med. Inst., Vinnitsa, USSR) and I. G. Nazarenko. *Khirurgiia (Moskva)* 45(2):29-33, 1969.

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3783 **OBSTRUCTION OF AN ESOPHAGEAL ANASTOMOSIS.** *(Rus.)* Kharitonov, L. G. (Cent. Clin. Hosp., Moscow, USSR). *Grudn Khir* 11(1):92-98, 1969.

3784 **RETROSTERNAL ESOPHAGOPLASTY.** *(Rus.)* Blinova, A. A. (Munic. Hosp. No. 23, Novosibirsk, USSR). *Khirurgiia (Moskva)* 45(2):21-27, 1969.

3785 **DRUG TREATMENT OF SOME ESOPHAGEAL STENOSES.** *(Sp.)* Ramos, P. *Cir Cir* 35(4): 359-363, 1967.

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3788 **HIATUS HERNIA: CLINICAL STUDY OF 89 CASES.** *(Por.)* Vasconcellos, D. and T. B. Novais. *Hospital (Rio)* 72(5):1435-1450, 1967.

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3789 **SYMPOSIUM ON ESOPHAGEAL STENOSES: GENERAL CONCEPTS AND CLINICAL SYNTHESIS.** *(Sp.)* Zuckermann, C. *Cir Cir* 35(4):347-350, 1967.

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See also: 3472,3640,3646,3655,3673,3685,3686,3709,3721,3724,3725,3726,3728,4054

STOMACH

(Gastric ulcer is placed with peptic ulcer)

3793 **THE EARLY CARCINOMA OF THE STOMACH, WITH SPECIAL REFERENCE TO ITS SURGICAL TREATMENT.** *(E.)* Ishikawa, K. *Bull Soc Int Chir* 27(6): 542-545, 1968.

During the last 10 years, 127 cases of superficial carcinoma (15% of the gastric carcinomas) were gastrectomized. Only the gastric mucosa was involved in about half. Histology showed lymph node metastases in 7% of the 62 mucosal cancers and in 27% of the 65 submucosal cancers. Twenty-five cases were believed benign preoperatively and 29 as benign during the operation. Reoperation and resection of the stump was performed in 8 because cancer tissue was detected close to the gastric section. Of 210 gastric resections for superficial carcinoma the survival rate was 86% and for gastric cancer in general it was 25-30%. Recurrence occurred in 7 cases of mucosal cancer without lymph node metastases. In 14, death occurred within 3 yr after surgery. Radical gastrectomy with lymph node dissection is the treatment of choice.

3974 **HAEMATEMESIS AND MELENA: A REVIEW OF 326 CASES.** *(E.)* Balasegaram, M. (Gen. Hosp., Seremban, Malaysia). *Med J Aust* 1(12):485-488, 1968.

During a 4-yr period, 220 patients with hematemesis and 106 with melena were hospitalized. The bleeding was due to peptic ulceration (duodenal 110, gastric 83, stomal 2, acute erosion 11), esophageal varices 41, carcinoma of the stomach 11, drug reaction 6, chronic gastritis 3, miscellaneous causes 21, and undetermined 38. Twenty of the 110 patients with duodenal ulcers were over 60 years and 4 were women. Twenty of the 83 gastric ulcer patients were over 60 years of age and 8 were women. Chinese and Indian patients accounted for almost twice the number expected from their frequency in the population. All but 1 of the 41 esophageal varices were in males and 30 were in those below the age of 50. In 5 of the 6 drug-related cases there was a history of aspirin ingestion and in the other cortisone therapy. Of the entire 326 patients, 155 (47.5%) had some form of emergency surgery. Seven of the peptic ulcer group (1 duodenal, 6 gastric) died as did 8 with bleeding varices, 1 with cancer of the stomach and 2 with bleeding from undetermined sites. Emergency radiological studies were safe and were 90% accurate in duodenal ulcer diagnosis.

3975 **RADIOLOGIC ASSESSMENT OF LYMPHOSARCOMA OF THE STOMACH IN CHILDREN.** *(E.)* Lukomski, E. (Med. Acad., Poznan, Poland) and J. Alkiewicz. *Pol Rev Radiol Nuclear Med* 22(1):7-11, 1968.

A case of lymphosarcoma of the stomach in a 6-yr-old child presenting with epigastic mass and pain, hematemesis, tarry stools and peripheral node involvement is discussed. This rare lesion in children appeared radiologically as a gastric defect surrounded by a thin layer of contrast medium extending from the angle of the stomach to the pylorus. Destructive mucosal lesions were observed in the defect. Removal of three-fourths of the stomach and the adjacent lymph nodes provided the histologic diagnosis. Survival time from the onset of symptoms was 6 months.

3796 **IS GASTRECTOMY OR RESECTION OF THE CARDIA FOR ADVANCED CANCER OF THE STOMACH STILL JUSTIFIABLE AS A LAST RESORT PROCEDURE?** *(Ger.)* Häring, R. (Surg. Clin., Free U. Berlin, Germany), H. Kotlorz and D. Xanthakos. *Langenbeck Arch Klin Chir* 320(2-3):126-136, 1968.

Of 175 patients with advanced cancer of the stomach, 121 had gastrectomy with an operative mortality of 39 (32.2%) and 54 an abdominothoracic resection of the cardia with an operative mortality of 13 (24%) for a total operative mortality of 52 of 175 (29.7%). In 146 (83.4%) simultaneous splenectomy was performed in 36 (20%) removal of other organs (e.g., tail of the pancreas, colon, or left lobe of the liver). Most patients were over 50 yr; the frequency peak was 61-70. Although these patients were in advanced stages of their disease, and the operative mortality (29.7%) seems high, a comparison with the operative risks of palliative procedures applied to a group of 156 patients in comparable stages of disease, showed an operative mortality for exploratory laparotomy of 23.2% (17 of 73), for gastroenterostomy of 42.1% (8 of 19), fistula operations 27.2% (9 of 33) and enteroplasties 22.5% (7 of 31) for a total operative mortality rate of 26.2% (41 of 156). The value of the 'last resort' procedures of gastrectomy and total extirpation was further seen in survival time: 25% survived 1 yr, 6% 3 yr and 3% 5 yr while of those treated palliatively 80% died in 6 months and only a few survived 1 yr. Removal of the tumor also brings the patient symptomatic relief.

3797 **ANTIPERISTALTIC SEGMENTS OF JEJUNUM IN THE TREATMENT OF THE DUMPING SYNDROME.** *(E.)* Stemmer, E. A. (U. California, Irvine), S. A. Jones, S. C. Pearson and J. E. Connolly. *Arch Surg (Chicago)* 98(4):396-405, 1969.

In a 4 year period, 10 patients with severe symptoms following peptic ulcer surgery had 4 to 6 cm antiperistaltic segments of jejunum interposed between the stomach and duodenum. The segment of jejunum was mobilized on a vascular pedicle 1 to 2 feet from the ligament of Treitz. Rapid small bowel transit time demonstrated roentgenographically and/or abnormal glucose tolerance curves were present along with diarrhea and weight loss in all the patients. Four patients (2 vagotomy and pyloroplasty (V + P), 1 gastrectomy, 1 vagotomy and gastrectomy) obtained complete relief during their 5 to 24 month follow-up. Two patients (V + P) had very good relief during an 8 to 48 month follow-up. Three patients (2 V + P, 1 vagotomy and antrectomy) had good results with only occasional and mild symptoms during a 6 to 24 month follow-up. One patient (gastrectomy) was symptomatic to the same extent post-interposition as before.

3798 **PARTIAL OR TOTAL GASTRECTOMY FOR ADENOCARCINOMA OF THE CARDIA.** *(E.)* Kock, N. G. (Sahlgrenska Sjukhuset, U. Gothenburg, Sweden), E. Lewin and S. Pettersson. *Acta Chir Scand* 135(4):340-344, 1969.

A 10 year review of 46 patients (24 men, 22 women, maximal incidence in the 7th decade) with adenocarcinoma of the cardia, who underwent surgical removal of the tumor showed an operative mortality of 28%. The 5-year survival rate was 22% for the total material, and 30% for the 33 patients who survived the operation. Two principally different types of operation were performed: Proximal gastric resection including resection of the esophagus in 17 patients, and total gastrectomy with resection of the esophagus in 29 patients. None of the patients who underwent a proximal gastric resection survived 5 years, while 10 patients on whom a total gastrectomy was performed lived more than 5 years. Tumor infiltration was found near the edge of the proximal or distal resection lines in 3 of the proximal gastric resections but no such infiltration was found in the gastrectomies. Infiltration beyond the resection border was found in the periphery of the tumor in 5 of the 17 cases after gastric resection, and in 6 of 29 cases after total gastrectomy. Forty per cent of the 9 patients without nodal metastases lived 5 years while only 16% of the 37 patients with nodal metastases lived 5 years.

3799 ENDOSCOPIC STUDY OF PROTRUDED TYPE OF EARLY GASTRIC CANCER. *(Jap.)* Fukutomi, H. (Natl. Cancer Ctr. Hosp., Tokyo, Japan). *Iryo* 21(8):940-946, 1967.

Early cancer is defined as a cancerous invasion limited to the mucous and submucous layers and is classified in 5 types. Between 1962 and 1966, 162 cases were seen: 102 cases of adenomatous polyp, 16 of submucosal tumor, 28 of early cancer stage I, 6 of early cancer stage IIa, and 10 cases of stage IIa + IIc. If examination with a gastrocamera is carried out properly the risk of missing stage I lesions is low, but the differentiation of benign from malignant lesions is difficult. Of the polypous lesions more than 2 cm in diameter, 72% were malignant. Unevenness of the surface, broad-based hemorrhage and central depressions suggest malignancy. Redness is not diagnostic *per se;* pale,color and surface are often malignant. Round or oval configurations are often benign and long worm-like or map-like shapes are often malignant. The height of the gastric mucosa is often is less than the thickness in type IIa which is rarely found in its pure form, but is usually combined with other types (e.g., IIc). In cases difficult to differentiate, fiberscopic biopsy is necessary.

3800 GASTRIC CANCER. (CLINICAL-SURGICAL STUDY OF 300 CASES). *(Sp.)* Jaramillo Antillon, J. (Social Security Hosp., San Jose, Costa Rica) and M. Aguilar Bonilla. *Rev Med Costa Rica* 24(403):437-457, 1967.

A study of the mortality rates for gastric cancer in Central America during the period 1951-1967 showed that Costa Rica had the highest rate. Three hundred cases of gastric carcinoma were confirmed by surgery or at autopsy. Of these 248 were males and 52 were females. The average age was 55 yr and the range 23-87 yr. Nineteen per cent of the patients had cancer in their families; 9% had gastric cancer. Of the 300 patients 63% had tumors in the antropyloric region. The clinical findings were: anemia, epigastric pain; weight loss, meteorism, hyperorexia, anorexia and vomiting. Gastric cancer was found to be most frequent in persons with blood group A. Treatment in 55% of the cases was by subtotal gastrectomy. Mortality was highest in males. The high gastric cancer mortality rate is attributed to late diagnosis and inadequate surgical procedures. It is recommended that patients with symptoms suggestive of, but not radiologically confirmed, gastric tumors have periodic checks with X-ray. Because there is a high incidence of peptic ulcer transformation into a malignancy, it is recommended that peptic ulcer patients showing no clinical or radiological improvement be treated surgically.

3801 STUDIES IN THE DUMPING SYNDROME. IV. EFFECT OF CALCIUM THERAPY ON CALCIUM METABOLISM AND OSTEOPENIA IN GASTRECTOMIZED PATIENTS. *(E.)* Arman, E. (Karolinska Hosp., Stockholm, Sweden) and P. Reizenstein. *Amer J Dig Dis* 14(3):153-162, 1969.

Calcium metabolism was studied in 8 gastrectomized patients (7 males and 1 female, 49-70 yr of age), 7 of whom had skeletal pain. The amount of pain was directly related to the degree of malabsorption and/or malnutrition, and the level of serum alkaline phosphatase to the diarrhea and steatorrhea. The patients received a total of 150-550 g of calcium orally for 2-6 months. Following treatment 3 patients reported less back pain, but 7 had moderate gustatory and/or gastrointestinal discomfort. Retention of oral ^{47}Ca was significantly increased prior to treatment and normalized afterwards. The amount of bone salt in the hands and feet of the patients was significantly lower than for 24-yr-old controls and slightly less than for 80-yr-old controls. Treatment did not increase the amount of measurable bone salt; therefore, the possibility exists that treatment was not optimal.

3802 CLINICAL EXPERIENCE WITH A NEW ANTI-BLASTIC DRUG: ORTHO-MERPHALAN. (MEROPHAN) I. EFFECTS IN PATIENTS WITH ADVANCED GASTRIC CARCINOMA. *(It.)* Gardini, G. F. (Consultorio Previdenza Oncologico "F. Addarii", Bologna, Italy), S. Peretti, S. Castellari and C. Maltoni. *Cancro* 21(2):91-99, 1968.

Ortho-Merphalan was administered p.o. (8-12 mg/day) or i.v. (32 mg in 2 doses of 16 mg each or 4 of 8 mg each) to 23 patients (22 with gastric carcinoma, 1 with gastric reticulosarcoma). The period of therapy and the total dose administered were in a wide range because of drug intolerance, refusal to continue therapy, or the death of the patient. In 7 patients (30.43%) a partial remission (more than 4 weeks) was observed, radiologically and clinically confirmed; 5 of them survived for more than 1 yr. In 11 patients (47.82%) a subjective improvement was observed. Toxic effects were seen in the liver: fatty degeneration, necrobiosis, and necrosis. Leukopenia was observed in 78%; thrombocytopenia in 13%; nausea in 10%. Only 2 patients were still alive 148 and 103 weeks after the beginning of treatment.

3803 TOXIC SUBSTANCES IN CARCINOMA. V. A STUDY OF THE EFFECT OF TOXIC AMINES IN CANCER ON LIVER FUNCTION. *(Jap.)* Ishigaki, K. (Med. Fac., U. Hirosaki, Japan). *Hirosaki Med J* 19(3/4):131-151, 1967.

3804 STUDIES ON MALIGNANT TUMORS AND ANEMIA. V. IMMUNOLOGICAL STUDY OF THE COMMON ANTIGENICITY BETWEEN ANEMIA-INDUCING SUBSTANCES IN THE GASTRIC JUICE OF CANCEROUS STOMACHS AND IN THE HUMAN PLACENTA. *(Jap.)* Numata, T. (Med. Fac., U. Hirosaki, Japan). *Hirosaki Med J* 19(1):99-118, 1967.

3805 STUDIES ON MALIGNANT TUMORS AND ANEMIA. VI. THE EFFECT OF THE ANEMIA-INDUCING SUBSTANCE FROM THE TISSUE OF GASTRIC CANCER ON THE OSMOTIC FRAGILITY OF RABBIT RED CELLS *IN VITRO*. *(Jap.)* Yamagata, N. (Med. Fac., U. Hirosaki, Japan). *Hirosaki Med J* 19(3/4):488-498, 1967.

3806 STUDIES ON MALIGNANT TUMORS AND ANEMIA. VII. STUDY OF THE ANTIANEMIC SUBSTANCE IN THE TISSUE OF GASTRIC CARCINOMA. *(Jap.)* Yamagata, N. (Med. Fac., U. Hirosaki, Japan), S. Kitajima, M. Ariumi and K. Shindo. *Hirosaki Med J* 19(3/4): 499-504, 1967.

3807 ACUTE DILATATION OF THE STOMACH FOLLOWING SURGERY ON THE DIGESTIVE TRACT. *(Gr.)* Nousias, M. (People's Hosp., Athens, Greece), N. Khasos, A. Poullis and P. Linara. *Galenus* 9(5):269-279, 1967.

3808 CARCINOMA OF THE GLANDULAR STOMACH OF MICE [INDUCED] BY INSTILLATION OF 4-NITROQUINOLINE 1-OXIDE. *(E.)* Mori, K. (Sch. Med., Showa U., Tokyo, Japan). *Gann* 58(4):377-387, 1967.

3809 CANCER OF THE GASTRIC STUMP FOLLOWING RESECTION FOR PEPTIC ULCER. *(Pol.)* Bednarzewski, J. (1st Clin. Int. Dis., Acad. Med. Lublin, Poland) and H. Florkiewicz. *Pol Tyg Lek* 24(25):964-966, 1969.

3810 ARTERIOVENOUS FISTULA IN THE ANTERIOR PANCREATIC ARCH FOLLOWING GASTRIC RESECTION. *(Ger.)* Rüeff, F. L. (Surg. Clin., U. Munich, Germany), R. Bedacht, H. M. Becker and H. G. Heinze. *Munchen Med Wschr* 111(4):185-189, 1969.

3811 GASTRIC PAPILLOMA. *(Sp.)* Molins Benedetti, M. (Fac. Med. U. Barcelona, Spain) and J. M. Albiol Bosch. *An Med [Cir]* 55(1):31-36, 1969.

3812 ENDOSCOPY IN JAPAN WITH SPECIAL REFERENCE TO DETECTION OF GASTRIC CANCER. *(E.)* Kasugai, T. (Aichi Cancer Ctr. Hosp., Nagoya, Japan). *Gastroint Endosc* 15(4):204-205, 1969.

3813 MENETRIER'S DISEASE–GIANT FOLD GASTRITIS. *(E.)* Schindler, R. *Gastroint Endosc* 15(4):206-207, 1969.

3814 PERNICIOUS ANAEMIA AS A CAUSE OF DIARRHOEA. *(E.)* Urban, E. (U. Colorado Med. Ctr., Denver) and J. B. Solomon. *Med J Aust* 1(10):503-505, 1969.

3815 BILIOUS VOMITING AFTER GASTRIC SURGERY. *(E.)* Torrance, H. B. (Manchester Royal Infirm., England) and A. Watson. *J Roy Coll Surg Edinb* 14(3):161-164, 1969.

3816 HYPERTROPHIC HYPOSECRETORY GASTROPATHY. A CASE REPORT. *(E.)* Brown, W. G. (Dept. Pathol., Texas Med. Ctr., Houston) and M. W. Van Pelt. *Cancer* 23(5):1163-1170, 1969.

3817 THE SURVIVAL TIME OF CANCER PATIENTS: CONSIDERATIONS ON A CASE OF STOMACH CANCER WITH A SURVIVAL OF 20 YEARS. *(Ger.)* Mikhailov, M. L. (Clin. Int. Dis., U. Sofia, Bulgaria). *Med Welt* 20(10):513-516, 1969.

3818 SUBACUTE GASTRIC DILATATION IN AIR EVACUATED COMBAT INJURIES. *(E.)* Duncan, J. W. (Naval Hosp., San Francisco, Calif.) and R. F. Milnes. *Milit Med* 134(1):57-58, 1969.

3819 STOMACH CANCER. *(Por.)* Vasconcellos, D. (Inst. Gastroent., Recife, Brazil), F. Lima Castro, R. Knecht and E. Chaves. *Hospital (Rio)* 74(1):15-19, 1968.

3820 TWENTY YEARS' EXPERIENCE IN THE SURGICAL TREATMENT OF SPASTIC-HYPERTROPHIC PYLORIC STENOSIS. *(Ger.)* Fackert, S. (Pediat. Clin., Munic. Hosp., Mannheim, Germany). *Zbl Chir* 93(31): 1052-1054, 1968.

3821 STUDY OF THE REACTIVITY OF THE REGIONAL LYMPH NODES IN NEOPLASMS OF THE STOMACH. *(It.)* Battezzati, M. (Inst. Gen. Surg. Clin., U. Genoa, Italy), I. Donini and B. Borreani. *Gazz Int Med Chir* 73(3):191-208, 1968.

3822 MALIGNANT LYMPHOMA OF THE STOMACH TREATED WITH ENDOXAN AND TOYOMYCIN: REPORT OF A CASE. *(Jap.)* Terasaki, T. (2nd Tokyo Natl. Hosp., Japan), M. Tamaki, T. Kitajima and S. Matsumoto. *Iryo* 22(4):525-530, 1968.

3823 CARCINOMA OF THE STOMACH AND ITS TREATMENT. *(Gr.)* Khrysospathis, P. *Acta Chir Hellen* 95(2):189-228, 1968.

3824 GASTRIC ADENOMA (POLYP) IN A FOUR-YEAR-OLD CHILD: SURGICAL PATHOLOGY. [CASE REPORT] *(E.)* Brown, W. G. (Hermann Hosp., Houston, Texas) and E. Van Santen. *Med Rec Ann* 61(2): 47-48, 1968.

3825 COMBINED CONGENITAL GASTRIC AND DUODENAL OBSTRUCTION: PITFALLS IN DIAGNOSIS AND TREATMENT. [CASE REPORT] *(E.)* Haller, J. A. Jr. (Johns Hopkins Hosp., Baltimore, Md.) and J. L. Cahill. *Surgery* 63(3):503-506, 1968.

3826 ECCENTRIC PYLOROPLASTY FOLLOWING EXPLORATORY GASTRODUODENOTOMY. *(E.)* Imparato, A. M. (New York U. Med. Ctr., N. Y.) and E. L. Hanson. *Surg Gynec Obstet* 126(3):605-607, 1968.

3827 A NEW DEVICE FOR LONG TERM MAINTENANCE OF GASTRIC STOMA. *(E.)*

Reinhold, R. B. (Child. Hosp. Med. Ctr., Boston, Mass.). *Surg Gynec Obstet* 126(3):603-604, 1968.

3828 CICATRICIAL DEFORMATION OF THE BILE DUCT AFTER GASTRIC RESECTION AND ITS SURGICAL CORRECTION. *(Rus.)* Zavgorodnii, L. G. (Gorki Med. Inst., Donetsk, USSR) and A. F. Gredzhev. *Klin Khir (Kiev)* (5):42-45, 1968.

3829 HYPERTROPHIC PYLORIC STENOSIS APPEARING BELATEDLY IN INFANTS AND YOUNG CHILDREN. *(Fr.)* Couvreur, J. (Trousseau Hosp., Paris, France) and J. Gerbeaux. *Pediatrie* 23(4):397-403, 1968.

3830 CHRONIC AND RECURRENT VOLVULUS OF THE STOMACH WITH LATE RESULTS OF "COLONIC DISPLACEMENT". *(E.)* Tanner, N. C. (Charing Cross Hosp., London, England). *Amer J Surg* 115(4):505-515, 1968.

3831 GASTRO-DUODENAL JEJUNAL TRANSPOSITION. EXPERIENCE WITH ITS USE IN TREATING POST-GASTRECTOMY SYNDROME. *(Sp.)* Arango L., F. (Fac. Med., U. Antioquia, Medillin, Colombia) and J. E. Restrepo G. *Antioquia Med* 18(5):359-370, 1968.

3832 ANTACIDS: THEIR USE IN STOMACH SECRETION CONTROL. *(Fr.)* Maison, E. *Sem Ther* 44(5):321-323, 1968.

3833 GASTRIC LEIOMYOMA. *(Sp.)* Zaragosi Moliner, J. *Rev Esp Enferm Apar Dig* 27(2):301-310, 1968.

3834 A GASTRO-JEJUNO-COLIC FISTULA TREATED BY THE PI-FIGUERAS OPERATION. *(Sp.)* Gonzalez Abraldes, R. and G. Fernandez Albor. *Galicia Clin* 40(7):561-563, 1968.

3835 MONOGRAPHIC CLINICAL SESSON ON PYLORIC STENOSIS. *(Sp.)* Anonymous. (Hermans Aznar Ambulatory, Madrid, Spain). *Galicia Clin* 40(3):235-243, 1968.

3836 VAGOTOMY AS EMERGENCY TREATMENT OF SEVERE HEMORRHAGE DUE TO HEMORRHAGIC GASTROJEJUNITIS IN PATIENTS PREVIOUSLY SUBJECTED TO GASTRECTOMY. *(It.)* Scalfi, A. (Munic. San Paolo Hosp. Savona, Italy), R. Natero and G. B. Ghigliazza. *Osped Ital Chir* 17(4):339-369, 1968.

3837 SURGICAL TREATMENT OF CONGENITAL PYLORIC STENOSIS. *(Rus.)* Zolotukhin, N. A. *Vestn Khir Grekov* 100(6):89-90, 1968.

3838 ULCERATED GASTRIC PLASMACYTOMA. *(Rum.)* Jocu, I. (I. Cantacuzino Hosp., Bucharest, Romania). *Med Intern (Bucur)* 20(6):747-756, 1968.

3839 THE HETEROGENEITY OF ANTIBODIES DIRECTED AGAINST THE GASTRIC MUCOSA AND THYROID CELLS IN PERNICIOUS ANEMIA AND THYROID DISORDERS. *(Fr.)* Cruchaud, A. (U. Med. Clin., Cantonal Hosp., Geneva, Switzerland). *Helv Med Acta* 34(6, Suppl. 48):110, 1968.

3840 PERNICIOUS ANEMIA AND STOMACH CANCER. *(Fr.)* Hemmeler, G. (Fac. Med., U. Lausanne, Switzerland). *Praxis* 57(28):996-997, 1968.

3841 PATHOGENESIS OF STOMACH PERFORATION IN THE NEWBORN. *(Ger.)* Hasse, W. (Surg. Clin., Free U., Berlin, Germany), S. Grohme and J. Waldschmidt. *Chirurg* 39(8):380-381, 1968.

3842 HEARTBURN OF PREGNANCY. INCIDENCE AND PRELIMINARY CLINICAL TRIAL. *(E.)* Briggs, D. W. (Darlington Mem. Hosp., England). *Practitioner* 200(1198):824-827, 1968.

3843 TOTAL GASTRECTOMY WITH JEJUNAL INTERPOSITION: THE OPERATION OF TOMODA. *(Sp.)* Garriz, R. A. (Rawson Hosp., Buenos Aires, Argentina), H. Santangelo and J. A. Rodriguez Martin. *Prensa Med Argent* 55(7):330-332, 1968.

3844 SEROTONIN AND THE DUMPING SYNDROME: A REAPPRAISAL. *(E.)* Jesseph, J. E. (Ohio State U. Coll. Med., Columbus). *Surgery* 63(3):536-538, 1968.

3845 AN UNUSUAL CAUSE OF MASSIVE GASTRIC HEMORRHAGE (CHORIOEPITHELIOMA). *(Ger.)* Ansorge, D. (Surg. Clin., U. Rostock, Germany). *Zbl Chir* 93(14):510-514, 1968.

3846 BENIGN STOMACH NEOPLASMS. *(Pol.)* Konieczny, L. (Munic. Hosp., Koszalin, Poland) and T. Marszalek. *Pol Przegl Chir* 40(5):561-565, 1968.

3847 THE RADIOLOGICAL PATTERN OF INTRATHORACIC GASTRIC DYSTOPY. *(Cz.)* Ort, J. (Fac. Gen. Med., Charles U., Prague, Czechoslovakia), L. Melínová and H. Mostecký. *Rozhl Tuberk* 28(4):253-255, 1968.

3848 TEN CASES OF BENIGN GASTRIC TUMORS AND PSEUDOTUMORS. *(Sp.)* Allende, D. (Natl. Clin. Hosp. "Profesor Pedro Vella", Cordoba, Argentina), N. A. Abraham, R. Amuchastegui, E. O. Figueroa and A. Riberi. *Rev Argent Cir* 14(3/4):61-63, 1968.

3849 NECROSIS OF THE GASTRIC STUMP. *(Pol.)* Soltysiak, A. (3rd Surg. Clin., Lodz, Poland) and T. Zawadzki. *Pol Przegl Chir* 40(4):311-313, 1968.

3850 CANCER OF THE GASTRIC STUMP CAUSED BY BENIGN LESIONS. *(Sp.)* Argonz, V. (Brit. Sanat., Rosario, Argentina), A. Mon and L. Torres. *Rev Argent Cir* 14(3/4):64-66, 1968.

3851 ACUTE CHOLECYSTITIS FOLLOWING A PARTIAL GASTRECTOMY. *(Pol.)* Soltysiak,

A. (3rd Surg. Clin., Acad. Med. Lodz, Poland), J. Berner and B. Janowski. *Pol Przegl Chir* 40(4):314-316, 1968.

3852 ACUTE FIBRINOLYSIS SYNDROME IN STOMACH CANCER. *(Rus.)* Zhavoronkova, Ie. K. (I. P. Pavlov Inst. Physiol., Leningrad, USSR) and M. S. Strunskaia. *Ter Arkh* 40(1):113-116, 1968.

3853 EOSINOPHILIC GRANULOMA OF THE STOMACH. *(Sp.)* Cid, J. M. (Modern Clin., Baradero, Argentina) and C. A. Nogueras. *Rev Argent Cir* 14(3/4):97-98, 1968.

3854 THE SPREAD OF GASTRIC CANCER TO THE DUODENUM. *(Rus.)* Galandina, T. I. *Eksp Khir Anest* 13(1):47-50, 1968.

3855 SURGERY FOR CANCER OF THE GASTRIC STUMP. *(Rus.)* Berezou, Iu. Ie. (N. I. Pirogov 2nd Moscow Med. Inst., USSR) and M. D. Lapin. *Grudn Khir* 11(1):98-103, 1969.

3856 EXPERIMENTAL AND CLINICAL STUDIES ON THE ELECTRIC ACTION POTENTIALS OF THE STOMACH. *(E.)* Yanagisawa, K. (Jikei U. Sch. Med., Tokyo, Japan). *Jikei Med J* 14(1):23-24, 1967.

3857 CARCINOMA OF THE GLANDULAR STOMACH OF MICE [INDUCED] BY 4-HYDROXYAMINOQUINOLINE 1-OXIDE. *(E.)* Mori, K. (Sch. Med., Showa U., Tokyo, Japan) and A. Ohta. *Gann* 58(6):551-554, 1967.

3858 STATISTICAL OBSERVATIONS ON CASES OF SURGICAL GASTRIC DISEASES OPERATED AT OUR SURGICAL DEPARTMENT IN THE LAST FOUR YEARS. *(Jap.)* Miyasaka, S. (Tonan Hosp., Sapporo, Japan) and Y. Ochi. *Med J Mutual Aid Ass* 16(1):33-38, 1967.

3859 STOMACH LYMPHOSARCOMA IN A 7-YEAR-OLD BOY. *(Pol.)* Kosicka, M. (1st Clin. Child. Dis., Acad. Med., Poznan, Poland) and J. Alkiewicz. *Pol Tyg Lek* 24(8):181-182, 1969.

3860 CALCIFICATION IN MUCINOUS CELL CARCINOMA OF THE STOMACH. *(E.)* Yamagiwa, H. (Mie Prefectural U. Sch. Med., Tsu, Japan), K. Itoh, H. Ito, T. Takeuchi, H. Yoshimi and Y. Haneda. *Mie Med J* 17(1):47-55, 1967.

3861 SPONTANEOUS STOMACH RUPTURE. *(Por.)* Aquin, C. (Med. Fac., Fed. U. Ceara, Brazil). *Hospital (Rio)* 72(5):1523-1531, 1967.

3862 A STUDY OF THE SURGICAL TREATMENT OF TWO GROUPS OF 80 PATIENTS WITH STOMACH CANCER. *(Sp.)* Gama Carpio, J. P. *Cir Cir* 35(5):527-536, 1967.

See also: 3461,3464,3490,3495,3507,3525,3614,3626,3634,3640,3641,3644,3656,3659,3661,3673,3678,3681, 3689,3715,3718,3724,3725,3726,3741,3744,3757,3781,3921,3924,3935,3997,4034,4065,4082

SMALL INTESTINE

3863 EXPERIMENTAL COMPARISON OF LACTATED RINGER'S SOLUTION AND PLASMA IN THE TREATMENT OF INTESTINAL OBSTRUCTION. *(E.)*

Williams, R. D. (U. Texas, Med. Branch, Galveston), T. T. Huang, J. P. Parks and M. T. Ohlms. *Amer J Surg* 117(5): 638-642, 1969.

Mechanical obstruction was surgically induced on the ileum of 26 mongrel dogs (32-50 pounds) and measurements of plasma volume (serum albumin ^{125}I dilution) extracellular fluid volume ($Na_2{}^{35}SO_4$ dilution) and electrolytes were made before obstruction, 18 hr after obstruction, and after i.v. administration of either lactated Ringer's solution (20 cc/pound) or plasma (10 cc/pound) and lactated Ringer's solution (10 cc/pound). Six animals in each group were available for comparison. The only significant difference between Ringer's lactate alone and with plasma was an increase in urine output when plasma was given. Experience with 100 patients with obstruction due to adhesions showed that plasma did not significantly lower mortality.

3864 PRIMARY LYMPHOMA IN THE SMALL INTESTINE: PROBLEMS OF ROENTGENOLOGIC DIAGNOSIS. *(E.)*

Cupps, R. G. (Mayo Clin., Rochester, Minn.), J. R. Hodgson, M. B. Dockerty and M. A. Adson. *Radiology* 92(6):1355-1362, 1969.

The clinical, pathologic and radiologic features of 46 patients (29 men and 17 women) with histologically verified primary malignant lymphoma of the small intestine together with differential diagnoses are present. Although 12 presented similar, but not diagnostic, roentgenographic findings (a long, aperistaltic segment filled with an amorphous collection of diluted barium), 65% were indistinguishable by X-ray from other neoplastic and non-neoplastic diseases of the small bowel. The roentgenographic appearance of several types of lesions should alert the examiner to the possible presence of lymphoma of the small bowel: 1) a localized area of aneurysmal dilatation, 2) multiple lesions, and 3) malignant mucosal destruction involving a long segment of small intestine.

3865 HYPOTONIC DUODENOGRAPHY. *(E.)*

Stage, P. (Rigshospitalet, Copenhagen, Denmark) and L. Banke. *Gut* 10(6):428-432, 1969.

A new radiological technique, hypotonic duodenography, which involves duodenal intubation, barium instillation and aspiration followed by air insufflation and duodenal paresis due to oxyphenonium was carried out on 99 patients during a 2 yr period. Due to technical difficulties the study was unsatisfactory in 8 of the 103 examinations. The results were comparable in accuracy to conventional X-ray techniques in the investigation of recurrent ulcers following gastrectomies in 8 of 12 such patients. Hypotonic duodenography in 8 patients who had undergone choledochoduodenostomy or sphincteroplasty showed retrograde filling of the choledochal tract in all. Choledochus concrements suggested by filling defects in 3 patients were verified at surgery. There was 1 case of cancer of the pancreas and 4 other incorrect diagnoses among 15 patients in whom the technique suggested pancreatitis. Three patients with surgically proven chronic pancreatitis were diagnosed as normal. In 45 patients the diagnosis was firm and operations were carried out after the investigation.

3866 SYSTEMIC SCLEROSIS AND SMALL BOWEL INVOLVEMENT. *(E.)*

Bluestone, R. (Royal Postgrad. Med. Sch., London, England), M. MacMahon and J. M. Dawson. *Gut* 10(3):185-193, 1969.

The structure and function of the small bowel were studied in 21 patients (18 women, mean age 53 yr, 3 men, mean age 64 yr) with systemic sclerosis. Twelve had radiological small bowel involvement; 6 of these had mild steatorrhoea and 2 impaired vitamin B_{12} absorption. The diagnosis of small bowel involvement was radiological. Dilated loops of duodenum and jejunum were the striking abnormality and best detected by accurately measuring the diameter of the lumen. Thickened folds, 'pseudodiverticula', wire spring-like appearance, disordered motility, and flocculation were found. Small bowel bacterial colonization may account for the steatorrhea in 1 patient and possibly in two. There was no correlation between duration, severity, or frequency of other organ involvement, with the exception of almost invariable esophageal abnormality, in those patients with small bowel disease. Systemic sclerosis affects the small bowel frequently and often early in the course of the disease; involvement was usually occult.

3867 OPERATIVE TREATMENT OF TYPHOID PERFORATION OF THE BOWEL. *(E.)*

Archampong, E. Q. (Ghana Med. Sch., Accra). *Brit Med J* 3(5665):273-276, 1969.

One hundred and twenty-one proved cases (91 males, 30 females) of typhoid perforation were seen in a 3 yr period; the incidence of perforation is the highest recorded. All but 15 patients were between 6 and 34 yr. All patients were treated by laparotomy with closure and drainage in addition to antibiotics. Fewer females with typhoid fever may report to the hospital and then only when seriously ill. Female mortality was 33%, male 22% and the total 29.8%, but increased to 76% when operation was performed after the fifth day of perforation.

3868 THE EFFECTS OF ENDOTOXINS ON ENZYMES AND SUBSTRATES. THE PATHOPHYSIOLOGY OF ILEUS. *(Ger.)*

Herfarth, C. (U. Surg. Clin. Marburg a.d. Lahn, Germany), G. Brobmann and I. Staib. *Langenbeck Arch Klin Chir* 320(2/3):146-154, 1968.

Enzyme determinations were made in liver and abdominal muscle tissues of (unspecified) animals suffering from ileus after the administration of endotoxins from *E. coli.* After 1 dose of 5000 γ/kg there was no increase in serum lactate and pyruvate 6 hr after injection. After the same dose and an 8 hr interval, lactase activity increased significantly, and after 10,000 γ/kg a similar increase was observed together with an increase in the lactase/pyruvate ratio. Doses of 2000 γ/kg 3 times caused a moderate increase in lactase activity but it was only with 3000 γ/kg 3 times that the increase in pyruvate and lactase activity was marked. In animals with ileus there were no significant alterations in lactate or pyruvate activity in 48 hr experiments. No significant changes were observed in in lactate dehydrogenase, malate dehydrogenase, SGOT, or aldolase activity, but SGPT and, to a lesser degree, sorbitol dehydrogenase showed decreased activity. In the ileus animals 48 hr after treatment liver lactate dehydrogenase showed a statistically significant increase while activity in muscle remained constant.

3869 THE EFFECTS OF ENDOTOXIN ON ELECTROLYTE CONCENTRATION IN LIVER AND MUSCULATURE. THE PATHOPHYSIOLOGY OF ILEUS. *(Ger.)* Staib, I. (U. Surg. Clin., Marburg a.d. Lahn, Germany), H. Mikosch and C. Herfarth. *Langenbeck Arch Klin Chir* 320(2/3):137-145, 1968.

Female white rats (200-360 g) with ileus created by surgical ligation (2 cm proximal to the ileocecal juncture) were given 5000/kg once, 10,000/kg once, 2000/kg 3 times, 3000/kg 4 times, *E. coli* endotoxin i.p. and the electrolytes in liver and abdominal muscle measured at varying times after injection. A distinct relationship between time and dose was demonstrated through the diminution of intracellular potassium concentration in the liver. The ability of the liver to detoxify endotoxin was proven by the small or nonexistent changes in potassium in liver tissue after repeated doses at a sublethal level. Since bacteria as well as their toxins play a clear role in the clinical picture of ileus, its masking by antibiotics should be carefully considered when evaluating severity.

3870 URINARY CHOLECYSTOKININ AND ANTICHOLECYSTOKININ IN CHRONIC DUODENITIS. *(It.)* Fontana, G. (Inst. Spec. Med. Pathol., U. Bologna, Italy), G. Gasbarrini, P. Azzaroli and P. Vezzadini. *G Clin Med* 48(12):1432-1448, 1967.

Urinary cholecystokinin and anticholecystokinin were determined, using biological and electrophoretic methods, before and after stimulation with corn oil and sorbitol in 12 patients with chronic duodenitis, and in 20 normal subjects. In normal subjects sorbitol and corn oil increased the cholecystokinin activity more than twice, and reduced for about 40% the anticholecystokinin activity by about 40% within 2 hr. These values did not differ significantly from those obtained in subjects with chronic duodenitis. In 2 cases cholecystokinin activity was clearly lower than the minimum normal values. This could have been due to a lower response of the duodenal mucosa, affected by inflammatory changes, to the stimulating agents.

3871 RECENT PROGRESS IN DISEASES OF THE SMALL INTESTINE. *(E.)* MacMahon, A. (United Oxford Hosp., England) and D. Hubble. Pp. 198-210 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3872 THE RADIOLOGICAL APPROACH TO THE DIAGNOSIS OF MECKEL'S DIVERTICULUM DURING INFANCY. *(E.)* Fortier-Beaulieu, M. (Child. Dis. Hosp., Paris, France), P. Cahumont, M. Labrune and D. M. Goldlust. Pp. 303-316, in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3873 ILEO-CAECAL TUBERCULOSIS: A STUDY OF SEVENTY CASES. *(E.)* Fernandez, F. L. (Santo Tomas U. Hosp., Manila, Philippines) and S. Z. Alvarez. *Santo Tomas J Med* 22(6):376-379, 1967.

3874 MECKEL'S DIVERTICULUM. *(Gr.)* Petridis, P. A. (Greek Comm. Hosp., Cairo, Egypt). *Acta Chir Hellen* 95(1):34-47, 1968.

3875 A CASE OF ACUTE ABDOMEN CAUSED BY INFLAMMATION OF AN ILEAL DUPLICATION. *(It.)* Randone, P. B. (S. Annunziata Munic. Hosp., Taranto, Italy). *G Ital Chir* 23(6):981-990, 1967.

3876 SMALL INTESTINE TRANSPLANTATION: SURGICAL TECHNIQUE AND FUNCTIONAL EXPLORATION. *(Sp.)* Grenier, J. F., D. Adriansen, G. Santizo-Lepe, L. Michel, J. Kachelhoffer, R. Alvarez Cordero and A. G. Weiss. *Acad Peru Cir* 20(1):15-20, 1967.

3877 EXPERIENCES WITH MECKEL'S DIVERTICULUM. *(E.)* Schücke, C. P. (Dept. Surg., Rockwood Clin., Spokane, Wash.) and E. V. Johnston. *Surg Gynec Obstet* 126(1):91-93, 1968.

3878 DOWN'S SYNDROME (MONGOLISM). AN ELECTRON-MICROSCOPE STUDY OF MUCOSA FROM THE SMALL INTESTINE. *(Ger.)* Saxl, O. (Res. Inst. Pediat., Brno, Czechoslovakia), J. Tichý, M. Hradský and V. Hrstka. *Z Gastroent* 6(1):11-18, 1968.

3879 HISTOPATHOLOGICAL FINDINGS IN PARASITIC INFESTATIONS OF THE SMALL INTESTINE. *(Sp.)* De Figueiredo, N. (Fed. U., Rio de Janeiro, Brazil), J. Rubens, H. Tinoco de Carvalho and J. Rodrigues da Silva. *Bol Chile Parasit* 23(1/2):57-59, 1968.

3880 UNIQUE ASPECTS OF SMALL INTESTINAL INTUSSUSCEPTION IN INFANTS AND CHILDREN: INTUSSUSCEPTIONS DUE TO A METASTATIC MALIGNANT MESENCHYMOMA AND AN INDWELLING LONG INTESTINAL TUBE. *(E.)* Touloukian, R. J. (Rhode Island Hosp., Providence) and F. G. DeLuca. *Surgery* 63(2):346-351, 1968.

3881 ACUTE INTESTINAL OBSTRUCTION IN THE NEWBORN CAUSED BY INTESTINAL DUPLICATION. *(Fr.)* Bergoin, M. (Hosp. Ctr., U. Marseille-Nord, France), D. Unal, J. Aubert and M. Carcassonne. *Pediatrie* 23(5):589-590, 1968.

3882 DUODENAL DIVERTICULA. *(Sp.)* Copello, A. (Ital. Hosp., Buenos Aires, Argentina), A. Pataro, H. Marchitelli and J. Mussini. *Rev Argent Cir* 14(3/4):67-68, 1968.

3883 DISCOVERY OF A LARGE INTERNAL HERNIA WHICH INCLUDES THE ENTIRE SMALL INTESTINE AND TAKES UP A DEGENERATED POLYP OF THE SIGMOID. *(Sp.)* Pollan Rey, M. and F. Montoto Estevez. *Galicia Clin* 40(6):471-472, 1968.

3884 CLINICAL PICTURE AND DIAGNOSIS OF INCOMPLETE ROTATION OF THE INTESTINES IN CONJUNCTION WITH DUODENAL OBSTRUCTION IN CHILDREN. *(Rus.)* Cheskis, A. L. (Inst. Pediat., Acad. Med. Sci. USSR, Moscow) and M. A. Filippkin. *Sovet Med* 31(3):115-120, 1968.

3885 TUMORS OF THE SMALL INTESTINE. FOUR CASES. *(Jap.)* Sakamoto, M. (Sagamihara atl. Hosp., Japan), S. Tachisawa, N. Nagai and T. Takafuji. *ryo* 22(11):1329-1332, 1968.

3886 CANCER IN THE THIRD PORTION OF THE DUODENUM. *(Sp.)* Abdala, A. *Int Surg* 9(1):86-91, 1968.

3887 THE RAPUNZEL SYNDROME: AN UNUSUAL COMPLICATION OF INTESTINAL BEZOAR. *E.)* Vaughan, E. D. Jr. (Vanderbilt U. Sch. Med., Nashville, enn.), J. L. Sawyers and H. W. Scott Jr. *Surgery* 63(2):339-43, 1968.

3888 TRAUMATIC INTRAMURAL HEMATOMA OF THE DUODENUM. [CASE REPORT] *(E.)* hosh, S. (Lutheran Hosp., Cleveland, Ohio), B. Q. Walker nd C. M. McKenna Jr. *Arch Surg* 96(6):959-962, 1968.

3889 RETROPERITONEAL RUPTURE OF THE DUODENUM FOLLOWING BLUNT TRAUMA. *E.)* Deodhar, M. C. (Christian Med. Coll., Ludhiana, Punjab, ndia), K. S. Duleep, S. S. Gill and F. C. Eggleston. *Arch Surg* 6(6):963-966, 1968.

3890 VOLVULUS OF THE ENTIRE SMALL INTESTINE WITHOUT ASSOCIATED MALRO-ATION. [CASE REPORT] *(E.)* Cueto, J. (VA Hosp., larksburg, W. Va.), C. B. Mendoza Jr., G. W. Easley and . H. Gerwig Jr. *Arch Surg* 96(6):953-955, 1968.

3891 DYSGAMMAGLOBULINEMIA WITH NODULAR LYMPHOID HYPERPLASIA OF THE SMALL NTESTINE. [CASE REPORT] *(E.)* Grise, J. W. (Crittenden em. Hosp., West Memphis, Ark.). *Radiology* 90(2):579-580, 968.

3892 THE WITSEL-EISELBERG ENTEROSTOMY IN EMERGENCY SURGERY. *(Fr.)* Tzurai, I. 2nd Surg. Clin., Emerg. Hosp., Bucharest, Romania), P. ostesco, G. Popovici and P. Blidaru. *Bull Soc Int Chir* 27(5): 62-366, 1968.

3893 LEFT PARADUODENAL HERNIA. [CASE REPORT] *(E.)* Peltokallio, P. (Hosp. Cent., U. elsinki, Finland) and T. V. Kalima. *Amer J Surg* 115(3): 67-370, 1968.

3894 PERFORATION OF JEJUNUM BY RETICULUM CELL SARCOMA IN PREGNANCY. [CASE EPORT] *(E.)* Henderson, M. (Royal Infirm., Edinburgh, cotland) and W. G. Paterson. *Amer J Surg* 115(3):385-388, 968.

3895 DUODENAL STENOSIS IN THE NEWBORN AND NURSLING INFANT: REPORT OF 62 ASES. *(Fr.)* Aubrespy, P. (23 Rue Edmond-Rostand, arseille, France) and S. Derlon. *Pediatrie* 23(5):581-582, 968.

3896 SURGICAL COMPLICATIONS OF ILEAL SEGMENT URINARY DIVERSION. *(E.)* Jaffe, B. M. (Washington U. Sch. Med., St. Louis, Mo.), E. M. Bricker and H. R. Butcher Jr. *Ann Surg* 167(3):367-376, 1968.

3897 MOBILIZATION OF THE DUODENUM: A SURGICAL MANEUVER INCORRECTLY CREDITED TO KOCHER. *(E.)* Madden, J. L. (St. Clare's Hosp., New York, N. Y.), S. Kandalaft and M. Eghrari. *Surgery* 63(3):522-526, 1968.

3898 STENOTIC EOSINOPHILIC GRANULOMA OF THE SMALL INTESTINE. *(Sp.)* Garcia-Sabell, D., C. Leira Tormo, G. Fernandez Albor and R. Varela Nunez. *Galicia Clin* 40(6):469-471, 1968.

3899 TROPICAL JEJUNITIS IN AMERICANS SERVING IN VIETNAM. *(E.)* Sheehy, T. W. (U. Alabama Med. Ctr., Birmingham), L. J. Legters and D. K. Wallace. *Amer J Clin Nutr* 21(9):1013-1022, 1968.

3900 ACUTE INFLAMMATION AND PERFORATION OF GRANULOMA OF THE SMALL INTESTINE. *(E.)* Scarlett, G. (Sydney, Australia). *Med J Aust* 1(19):806-807, 1968.

3901 MECONIUM ILEUS EQUIVALENT. *(E.)* Lynch, G. *J Irish Med Ass* 61(372):209-212, 1968.

3902 CIRCULATORY CHANGES IN THE MUCOSA AND MUSCLE LAYER OF THE SMALL INTESTINE OF RATS AFTER EXPOSURE TO SUPRALETHAL DOSES OF RADIATION. *(Ger.)* Zsebök, A. B. (Res. Inst. Med. Radiol., Hungarian Acad. Sci., Budapest), G. Jánossy and I. F. Mészáros. *Strahlentherapie* 137(2):177-182, 1969.

3903 ENTEROPATHOGENIC EFFECTS OF *ESCHERICHIA COLI* IN ILEAL LOOPS OF THE RABBIT AND THEIR RELATION TO THE HETEROGENETIC ANTIGEN CONTENT. *(Sp.)* Hojyo, M. K. (Child. Hosp., Mexico City, Mexico), L. M. Flores, J. Kumate and J. Carrillo. *Bol Med Hosp Infant Mex* 26(1):15-22, 1969.

3904 USE OF THE "SPACE DIET" IN THE MANAGEMENT OF A PATIENT WITH EXTREME SHORT BOWEL SYNDROME. *(E.)* Thompson, W. R. (Rhode Island Hosp., Providence), R. V. Stephens, H. T. Randall and J. R. Bowen. *Amer J Surg* 117(4):449-459, 1969.

3905 INTESTINAL LYMPHANGIOMA. *(Sp.)* Piera Mas-Sarda, J. (Santa Cruz San Pablo Hosp., Barcelona, Spain). *An Med [Cir]* 55(1):37-41, 1969.

3906 JEJUNOSTOMY. PERSONAL TECHNIQUES. *(Sp.)* Salleras, V. (Sagrado Corazón Hosp., Spain). *An Med [Cir]* 55(1):77-80, 1969.

3907 INTESTINAL OBSTRUCTION ASSOCIATED WITH CHOLESTYRAMINE THERAPY. *(E.)*

Cohen, M. I. (Montefiore Hosp., Bronx, N. Y.), P. R. Winslow and S. J. Boley. *New Eng J Med* 280(23):1285-1286, 1969.

3908 ADENOMAS OF THE SMALL INTESTINE. A REPORT OF FOUR CASES WITH SPECIAL REFERENCE TO THEIR RELATION TO CARCINOMAS. *(E.)* Johansen, A. (Bispbejerg Hosp., Copenhagen, Denmark) and E. Larsen. *Acta Path Microbiol Scand* 75(2):247-256, 1969.

3909 A NEW METHOD FOR CLOSING THE DUODENAL STUMP BY MEANS OF AN ENVELOPE-SHAPED CUT. *(It.)* Santagati, V. (Inst. Pediat. Surg., U. Catania, Italy). *Osped Ital Chir* 17(6):713-717, 1967.

3910 BOUVERET'S SYNDROME. PYLORIC AND DUODENAL STENOSIS DUE TO A GALLSTONE. *(It.)* Calzoni, D. (Novara Main Hosp., Italy) and L. Graziano. *Osped Ital Chir* 17(1):61-73, 1967.

3911 AN AUTOPSY CASE OF PEUTZ-JEGHERS SYNDROME. *(E.)* Yatani, R. (Mie Prefectural U. Sch. Med., Tsu, Japan), S. Naruse, H. Shisa, H. Ito, T. Ohnishi and S. Inamori. *Mie Med J* 17(1):39-45, 1967.

3912 ILEUS IN THE NEWBORN: ATRESIA AND DUODENAL STENOSIS. *(Sp.)* Teixidor de Otto, J. (Pediat. Hosp., Cologne, Germany). *Cir Ginec Urol* 21(5): 373-376, 1967.

3913 SARCOMA OF THE SMALL INTESTINE SIMULATING ACUTE APPENDICITIS. *(Pol.)* Kulicz, A. (Dept. Radiol. Silesian Acad. Med., Zabrze, Poland) and Z. Rychlik. *Przegl Lek* 23(11):805-806, 1967.

3914 A CASE OF INTUSSUSCEPTION CAUSED BY LYMPHOID HYPERPLASIA AT THE DISTAL END OF THE ILEUM. *(Jap.)* Mikami, K. (2nd Tokyo Natl. Hosp., Japan), T. Terasaki and K. Abe. *Iryo* 22(4):522-524, 1968.

See also: 3443,3618,3627,3629,3638,3684,3696,3705,3710,3723,3825,3831,3844,3935,4061

Peptic Ulcers

3915 CATHETER DUODENOSTOMY FOR THE DIFFICULT DUODENAL STUMP. *(E.)* Lamphier, T. A. (Hialeah, Fla.) and C. Crooker. *Southern Med J* 61(7):751-757, 1968.

Twelve cases in which modified Hofmeister procedures were performed for duodenal (1 case of gastric and 11 duodenal) ulcers and in which catheter duodenostomy of the duodenal stump was utilized are presented. Marked edema and/or fibrosis were the indications for catheter duodenostomy in 10 of the cases, while in the other 2, the ulcer lay close to the ampulla of Vater. The catheters were removed in 10 to 18 days. All results were considered excellent and the complications consisted of low grade pancreatitis (1), a wound abscess (1), skin excoriation (1), low grade cellulitis (1), drainage around the catheter (1), and a persistent fistula (1). There were no complications in 6. All fistulae were closed within 29 days after removal of the catheter, however, and most within 2 weeks.

3916 VAGOTOMY AND PYLOROPLASTY IN DUODENAL ULCER THERAPY. *(It.)* Castiglioni, G. C. (Inst. Clin. Gen. Chir., Sacro Cuore Catt. U., Rome, Italy), G. Tamborini, F. Zucchetti and R. Alma. *Chir Pat Sper* 16(1):5-23, 1968.

Truncal vagotomy, associated with Heineke-Miculicz's pyloroplasty and Stam's gastrostomy, was performed in 19 patients. The indications for the vagotomy were: elderly patients with cardiovascular diseases, diabetes, obesity or chronical diseases; patients with local anatomopathologic alteration; patients with hypervagotomy documentated by insulin and histamine tests, increased gastric secretion in 12 nocturnal hours and hyperchlorhydria; and young patients (under 25 yr old) in good general conditions. The 19 patients were followed once every 3 months for 24 postoperative months. It was noted that reestablishment of intestinal peristalsis was few hours later than the normal 5 days delay characteristic of other gastric operations. After 30 days, postprandial gastric repletion was found in 83.3% (normalizated after the 2nd month); good clinical results with disappearance of ulcer symptomatology in 94.4%; late gastric discharges with severe hypotonia of the organ in all the patients (at the 3rd month only in 10.5%). After 3 months, 1 case of serrated duodenal stenosis with gastric ectasia and alimentary vomiting was found. After 6 months, gastric discharges were normalized in all the patients; the ulcer cavity had disappeared in 52.6%, accompanied by a progressive normalization of the hematic values, serum proteins, body weight, and by a decrease of gastric secretions with negative insulin and histamine tests.

3917 THE EFFECTS OF VARIOUS DRUGS ON EXPERIMENTAL ULCERS IN THE IMMOBILIZED RAT. *(Ger.)* Schramm, H. (U. Surg. Clin., Jena, Germany). *Deutsch Z Verdau Stoffwechselkr* 28(5-6):305-312, 1968.

Ventricular ulcers were produced in rats by keeping them in a lattice corset to provoke psychological stress. Only water was given 1 day before immobilization, and no food or water during the 24-hr immobilization. No ulcers were observed in 30 male or 30 female rats that were not restrained. The sounding of a bell or the flashing of a light did not influence ulcer formation. Since the number of ulcers was significantly higher in female (85%) than in male (10%) rats, dinestrol (170 γ/kg) was given to male rats, who then showed a percentage of ulcers almost equal to the female. Dinestrol alone had no effect on ulcer formation. Atropine and papaverine (15 mg/kg) decreased the incidence of ulcers in female rats to 45% and 20%, resp. (Papaverine at 15 mg/kg reduced the percentage only to 80.) Promethazine, as well as lowered room temperature, produced ulcers in the glandular portion of the stomach in all rats. Neostigmine did not significantly increase the ulcer rate.

3918 POSSIBLE ETIOPATHOGENIC CORRELATIONS BETWEEN ALOPECIA AREATA AND GASTRODUODENAL ULCER. *(It.)* Lo Presti, G. (Vittorio Em. II Civ. Hosp., Catania, Italy). *Minerva Derm* 43(4):151-165, 1968.

In 11 patients affected by alopecia areata, radiologic examination of the stomach and duodenum revealed gastroduodenitis, with trophic-hypertrophic alterations in 6, catarrhal lesions in 3, ulcerous lesions in 1 and presumed ulcerous lesions in 1. In 5 cases, clinical examination showed hyperchlorhydria, in 6 hypochlorhydria. Psychiatric evaluation revealed in all patients a neurotic personality, sexual immaturity and feelings of aggression towards parents.

3919 ANTERIOR PYLORECTOMY AND VAGOTOMY FOR COMPLICATED PEPTIC ULCERATION. *(E.)* Scott, P. R. (Royal Melbourne Hosp., Australia). *Aust New Zeal J Surg* 38(3):256-262, 1969.

A series of 54 bilateral truncal vagotomies combined with anterior pylorectomy for peptic ulceration performed during a 5-yr period, included 9 cases of bleeding peptic ulcer. All 9 cases were chronic and associated with a long history of dyspepsia, 3 had bled previously (1 on 14 other occasions). Seven of the ulcers were located on the posterior wall of the duodenum within its first inch, 2 were anteriorly positioned at the same level, 1 had perforated. The patients were 6 males and 3 females, 26 to 76 yr in age. The surgical indication was failure of blood replacement and general supportive therapy as evidenced by continued or recurrent bleeding. Only 1 of the 9 failed to achieve a satisfactory result. (This compares favorably with the results of vagotomy and Mikulicz pyloroplasty: 4 of 14 cases so treated during the same period bled again and 3 required further surgery.) Eight of the 9 patients survived; they have been followed for 4 months to 3 yr and interviewed and graded according to Visick's system. There were 6 in Visick's grade I, 1 in Grade II, and 1 in Grade IV. The long-term failure was due to an incomplete vagotomy, confirmed by a Hollander insulin test. The difficulty encountered was technical and caused by hepatosplenomegaly and imperfect exposure of the abdominal esophagus. Although the patient had no further bleeding, he had persistent pain from his unhealed ulcer. A Polya gastrectomy was performed after 4 months.

3920 'LOMOTIL' IN THE TREATMENT OF EPISODIC DIARRHEA AFTER VAGOTOMY.

(E.) Cox, A. G. (Hammersmith Hosp., London, England) and F. C. Y. Cheng. *Brit J Clin Pract* 22(5):211-212, 1968.

Of 107 patients reviewed after vagotomy, 12 reported postoperative, episodic diarrhea. All 12 (9 had had vagotomies and pyloroplasties, 2 vagotomies and gastrojejunostomies and 1 a vagotomy and partial gastrectomy) were subjected to a double blind study of diphenoxylate hydrochloride and atropine sulfate (Lomotil) and a placebo. Of the 10 completing the trial, 8 responded to Lomotil with a disappearance of urgency while only 3 responded to a placebo. The average stool frequency was 4.25 on diarrhea days before treatment, 2.5 when taking placebo, and 1.8 when taking Lomotil. At 20 mg Lomotil daily, two instances of dizziness, 1 of blurred vision and 1 of a transient rash and blisters were observed in 3 patients. One patient receiving 10 mg of Lomotil daily and 1 patient receiving a placebo also reported mild dizziness.

3921 **JUXTAPYLORIC LATEROLATERAL GASTRODUODENOSTOMY AS GASTRIC DRAINAGE PROCEDURE, COMPLEMENTARY TO VAGOTOMY.** *(E.)* Alexiu, O. (Babies' Hosp., Bucharest, Rumania), E. Pacescu and B. Furtunescu. *Chir Gastroent* 2(2):239-241, 1968.

Juxtapyloric laterolateral gastroduodenostomy was employed as a drainage procedure in 38 patients who underwent selective or truncal vagotomies for gastroduodenal peptic ulcers. At follow-up after 1 yr, all were well and without abdominal complaints. Reservoir function was comparable to normal stomachs, there was rhythmical evacuation of the stomach, and an absence of contrast medium passage through the pylorus.

3922 **ASPIRIN AND UNCOMPLICATED PEPTIC ULCER.** *(E.)* Chapman, B. L. (Royal Newcastle Hosp., Newcastle, Australia) and J. M. Duggan. *Gut* 10(6):443-450, 1969.

Two hundred and ninety-five patients hospitalized during a 6 yr period for the treatment of uncomplicated, proven, peptic ulcer were studied. There were 161 males (99 duodenal, 55 gastric, 3 combined sites, and 4 postsurgical) and 134 females (51 duodenal, 79 gastric, 1 combined sites, and 3 postsurgical). The maximal incidence for males and females was in the fifth decade for duodenal ulcers and in the sixth decade for gastric ulcers. Among females the incidence peak for gastric ulcers spanned the fourth, fifth and sixth decades with another peak in the eighth decade. The aspirin habit, mainly in the form of aspirin, phenacetin and caffeine, was present in 79% of all. Seventy (67.3%) of the females took 2 or more doses per day as did 54 (43.9%) of the males. Aspirin ingestion was particularly common in the younger female patients (age 30 to 59) among whom there was an excess of gastric ulcers. There was no correlation with aspirin ingestion in the case of duodenal ulcers for either sex, nor in gastric ulcers in males. Tension headache was the most common indication (90%) for aspirin ingestion.

3923 **PERFORATED DUODENAL ULCER IN READING FROM 1950 TO 1959.** *(E.)* Cassell, P. (Royal Berkshire Hosp., Reading, England). *Gut* 10(6):454-459, 1969.

The records of 330 patients admitted a total of 335 times for perforated duodenal ulcers during a 10 yr period revealed a 1:12 ratio of perforated gastric to perforated duodenal ulcer. The peak age group was 51 to 60 among the 269 men and 43 women. All patients (312, 93.1%) whose condition permitted were operated upon immediately. Two hundred and forty-one (71.9%) had simple closures (operative mortality 5.5%), 19 (5.7%) had simple closure and gastrojejunostomy (operative mortality 5.3%), and 52 (15.5%) had Polya (46) or Billroth I (6) partial gastrectomies (operative mortality 3.6% for Polya and 11.9% for Billroth I 1). Among the patients treated by simple closure, 84 of the 223 survivors were known to have come to surgery and 77 of them were operated upon within 5 yr. Two of 18 (11.2%) patients treated by simple closure and gastrojejunostomy were treated surgically again, both during the first 5 yr of follow-up. None of the patients treated with Polya gastrectomies required further surgery but 2 of the surviving Billroth I patients required conversions to Polya anastomoses for recurrent ulceration. The most common indication for further surgery in the entire series was recurrent dyspepsia. Six of 23 patients with recurrent perforations died as the result of it.

3924 **A COMPARISON OF POLYA GASTRECTOMY, TOTAL AND SELECTIVE VAGOTOMY, AND OF PYLOROPLASTY AND GASTROJEJUNOSTOMY.** *(E.)* Tovey, F. I. (Holdsworth Mem. Hosp., Mysore City, South India). *Brit J Surg* 56(4):281-286, 1969.

Eighty-one of 120 patients with Polya gastrectomies were followed for varying intervals (38 for 3-9 yr, 20 for 1-3 yr, 23 for less than 1 yr) and, excluding those with gross pyloric stenosis, 30% had gained weight, 56% remained the same, and 14% had lost weight. Most of those who gained weight were among the ones with half capacity. Follow-up (3 for over 6 yr, 39 for 3-6 yr, 65 for 1-3 yr, 111 for less than 1 yr) was available for 218 of 254 patients with a vagotomy and drainage procedure (114 selective vagotomy with 41 having gastrojejunostomy and 73 a pyloroplasty; 140 total vagotomy with 33 having a gastrojejunostomy and 107 a pyloroplasty). After excluding those with gross pyloric stenosis, 54% had gained weight, 31% remained the same and 14% had lost weight. Those with weight gain had the largest capacities. Selective instead of total vagotomy made no apparent difference in weight change or fecal fat output. There was no increase in fecal fat output after vagotomy as compared to control or preoperative levels. Pyloroplasty showed no advantage over gastrojejunostomy. There was 1 patient with "dumping" among the gastrectomies and none following vagotomy. There was 1 recurrent ulcer among the gastrectomies and 8 after vagotomy (2 selective and 6 total, 4 of which were proven incomplete).

3925 **PEPTIC ULCER IN MYASTHENIA GRAVIS.** *(E.)* Sanders, D. B. (U. Virginia, Charlottesville) and T. R. Johns. *JAMA* 207(10):1875-1877, 1969.

Gastric ulcers developed in 4 patients during anticholinesterase therapy for myasthenia. A conservative regimen healed the ulcers in two patients, and two required surgery. A combination of stress, antral stasis and possibly the direct effect of cholinesterase inhibitors on the gastric mucosa is suggested as the etiology of the gastric ulcers. Medical management is recom mended initially, unless malignancy is suspected. Surgical management was uncomplicated.

3926 **A STUDY OF FIBRINOLYTIC ACTIVITIES IN PEPTIC ULCER WITH EXCESSIVE BLEEDING.** *(Jap.)* Iwahara, S. (Iwakuni Natl. Hosp., Yamaguchi, Japan), K. Mitsui, Y. Murashige and Y. Mizuno. *Iryo* 22(1): 35-43, 1968.

Twelve cases of peptic ulcer with excessive bleeding (5 gastric and 3 duodenal ulcer, 4 upper gastrointestinal hemorrhage) were compared with 24 cases (12 gastric and 12 duodenal ulcer) without excessive bleeding. It was found that patients with excessive bleeding had: 1) decreased plasma fibrinogen levels, 2) increased plasminogen activator activity, as disclosed by Astrup's fibrin plate assay, and 3) increased activator and inhibitor activity.

3927 **PEPTIC ULCER INHIBITING PROPERTIES OF A NEW FRACTION FROM LICORICE ROOT (F_M100). I. EXPERIMENTAL PEPTIC ULCER AND GENERAL PHARMACOLOGY.** *(E.)* Takagi, K. (Fac. Pharm. Sci., U. Tokyo, Japan) and Y. Ishii. *Arzneimittelforschung* 17(12):1544-1547, 1967.

The methanol extract of licorice *(Glyzyrrhiza glabra)* and its purified fraction were found to have a significant effect in reducing the ulcers in pylorus-ligated rats. Other fractions and compounds of licorice root were tested and found to have no significant effect even when administered in high doses. The methanol extract of licorice did not reduce the severity of lesions induced in rats by stress (immobilization in water for 20 hr) or reserpine (5 mg/kg s.c.), but it had a weak antispasmodic activity against the stimulation of acetylcholine and histamine in the isolated guinea pig ileum. This activity was musculotropic and papaverine-like; not atropine-like or antihistaminic. The methanol extract inhibited slightly the progression of a test meal in mice. In the controls the mean length of the test meal traversed was 24.4 cm while in the treated animals it was 18.8 cm. Other experiments confirmed that the activity against gastric ulcers is due to the inhibition of gastric secretion and not to any anti-inflammatory action. The extract also has antidiuretic action but few other pharmacologic properties.

3928 **PEPTIC ULCERATION: PHYSIOLOGICAL EVALUATION OF DUODENAL ACIDIFICATION.** *(E.)* Poth, E. J. (U. Texas Med. Branch, Galveston) and D. Gold. *Ann Surg* 169(5):777-783, 1969.

Heidenhain pouches were constructed in healthy (25 to 35 pound) dogs. Following pylorectomy, 15 animals had a 20-cm segment of distal ileum interposed between the stomach and proximal duodenum and 17 had a similar segment interposed between the stomach and the reversed duodenum. Ileal ulceration occurred in 14 of 15 in the first group. None occurred in the other. Acid secretion was 336% greater in the interdigestive period and 170% higher in the postprandial phase in the animals whose distal duodenum was anastomosed to the proximal jejunum than in those with the proximal duodenum anastomosed to the proximal jejunum. Secretory rates in the former group were comparable to those obtained before interposition of the ileal segment. Gastroduodenostomy at the duodenojejunal junction resulted in gastric secretion changes similar to those obtained by ileal interposition and reversal of the duodenum.

3929 **SYNDROME ASSOCIATED WITH THE ABUSE OF ANALGESICS.** *(Rev.)(E.)* Gault, M. H. (Queen Mary VA Hosp., Montreal, Canada), T. C. Rudwal, W. D. Engles and J. B. Dossetor. *Ann Int Med* 68(4):906-925, 1968.

3930 **RADIOLOGICAL STUDY OF CONCOMITANT ULCERS.** *(E.)* Rao, K. S. (Osmania Gen. Hosp., Hyderabad, India) and U. S. N. Raju. *Indian J Radiol* 22(3): 131-137, 1968.

3931 **CLINICAL FORMS OF GASTRODUODENAL ULCERS.** *(Fr.)* Colin, R. *Gaz Med France* 76(5):991-1000, 1969.

3932 **HEALING OF A GASTRIC ULCER WITH PERSISTENCE OF THE CRATER. A CASE REPORT.** *(E.)* Weinrib, M. (U. Cincinnati Coll. Med., Ohio) and Y. Oikawa. *Gastroint Endosc* 15(4):218-219, 1969.

3933 **TREATMENT OF GASTRIC AND DUODENAL ULCER BY SPLANCHNIC NERVE BLOCK.** *(E.)* Stojic, B. (Lane Cove, New South Wales). *Med J Aust* 1(12):654-656, 1969.

3934 **CLINICAL AND PHARMACOLOGICAL STUDIES WITH A NEW NON-ANTICHOLINERGIC ANTISECRETORY PREPARATION: XYDE (XYLAMIDE-CR 242).** *(Sp.)* Mainoli, S., C. Milvio and D. Borellini. *Medicina (Mex)* 49(1054):152-157, 1969.

3935 **COMMENTS ON THE HUMAN TOLERANCE, CLINICAL PHARMACOLOGY AND THERAPEUTIC ACTIVITY OF A NEW NON-ANTICHOLINERGIC AGENT (XYDE) WITH ACTIVITY AGAINST GASTRODUODENITIS AND PEPTIC ULCERS.** *(Sp.)* Cascone, A. (Gen. Hosp., Lodi, Italy), D. Borellini and B. Jezzi. *Medicina (Mex)* 49(1054):141-147, 1969.

3936 **CLINICAL ASPECTS OF THE THERAPEUTIC EFFECT OF A NEW NON-ANTICHOLINERGIC ANTISECRETORY PREPARATION: XYDE (XYLAMIDE-CR 242).** *(Sp.)* Castelli, G. A. (Castelli Clin., Bergamo, Italy), L. Locatelli and G. F. Salvioni. *Medicina (Mex)* 49(1054): 147-152, 1969.

3937 **MILK DRIP THERAPY FOR UPPER GASTROINTESTINAL BLEEDING.** *(E.)* Scobie, B. A. (Hutt Hosp., Wellington, New Zealand). *Med J Aust* 1(20): 1028-1029, 1969.

3938 **TEN-YEAR RESULTS OF VAGOTOMY AND GASTRO-JEJUNOSTOMY IN THE TREATMENT OF CHRONIC DUODENAL ULCER.** *(E.)* Battersby, C. (U. Queensland, Brisbane, Australia). *Med J Aust* 1(12):616-619, 1969.

3939 **CLINICAL AND PHARMACOLOGICAL STUDY OF A NEW NON-ANTICHOLINERGIC ANTISECRETORY AGENT.** *(Sp.)* Rovati, A. L. (Rotta Res. Lab., Milan, Italy), P. L. Casula, L. Lepori and G. Da Re. *Medicina (Mex)* 49(1054):84-87, 1969.

3940 NEW ASPECTS OF GASTRODUODENAL PATHOPHYSIOLOGY: GASTRIN AND THE ANTIGASTRINS. *(Rev.)(It.)* Rovati, A. L. (Rotta Res. Lab., Milan, Italy). *Minerva Med* 60(23):999-1010, 1969.

3941 STRAIGHT TALK ABOUT PEPTIC ULCER. *(E.)* Zollinger, R. M. (Ohio State U. Coll. Med., Columbus), L. M. Hershenson, R. L. Wechsler and T. Drapanas. *Postgrad Med* 45(6):160-164, 1969.

3942 RESEARCH ON ENDOCRINE CELLULAR ELEMENTS OF THE PANCREAS AND GASTROINTESTINAL MUCOSA: HYPOTHESES CONCERNING THE PATHOGENESIS OF PEPTIC ULCERS. *(It.)* De Gregori, M. (Inst. Gen. Surg. Clin., U. Genoa, Italy) and F. Magrassi. *Rass Arch Chir* 5(6-bis):535-539, 1967.

3943 HYPOTHESES CONCERNING THE PATHOGENESIS OF RECURRENT PEPTIC ULCERS. *(It.)* De Gregori, M. (Inst. Gen. Surg. Clin., U. Genoa, Italy), F. Magrassi and A. Ferraro. *Rass Arch Chir* 5(6-bis):423-427, 1967.

3944 SELECTIVE GASTRIC VAGOTOMY. *(Sp.)* Carreras Domecq, L. C. (Great Welfare Hosp., Madrid, Spain) and J. L. Vallejo Ruiz. *Cir Ginec Urol* 21(5): 306-311, 1967.

3945 DUODENAL ULCER TREATMENT. *(Sp.)* Guitart Roca, J. (Barcelona, Spain). *Cir Ginec Urol* 21(5):316, 1967.

3946 COMMENTS ON OUR EXPERIENCE WITH THE VAGOTOMY IN DUODENAL ULCER TREATMENT. *(Sp.)* Gomez Fernandez, P. (Provincial Hosp Madrid, Spain) and A. Camacho Lozano. *Cir Ginec Urol* 21(5):314-315, 1967.

3947 VAGOTOMY IN PERFORATED DUODENAL ULCER TREATMENT. *(Sp.)* Curto Cardus, J. (Social Welfare, Barcelona, Spain) and D. Gomez Sanchez. *Cir Ginec Urol* 21(5):312-313, 1967.

3948 EMERGENCIES IN ULCER TREATMENT. *(Sp.)* Pi-Figueras, J. (Santa Cruz San Pablo Hosp., Barcelona, Spain), L. Gramatica Mateos and R. Hortas Iglesias. *Cir Ginec Urol* 21(5):340-343, 1967.

3949 SURGICAL TREATMENT OF DUODENAL ULCERS: COMPARATIVE STUDY BETWEEN BILLROTH I GASTRECTOMIES AND VAGOTOMY. *(Sp.)* Molins Benedetti, M. (Dept. Surg. Pathol., Barcelona, Spain), R. Julia Duarella and R. Marti Pujol. *Cir Ginec Urol* 21(5): 322-324, 1967.

3950 PEPTIC ULCER PERFORATED INTO THE PERITONEAL CAVITY. CONSIDERATIONS ON THERAPY AND STATISTIC REPORT OF 100 CASES. *(It.)* Giombolini, R. (Foligno Gen. Hosp., Italy) and C. Leo. *Osped Ital Chir* 17(1):53-59, 1967.

See also: 3453,3456,3466,3519,3520,3644,3794,3809,3832,4084,4154

Regional Enteritis

3951 **THE PROBLEM OF REGIONAL ENTERITIS (CROHN'S DISEASE).** *(Cz.)* Háša, J. (Inst. Milit. Med., Prague, Czechoslovakia), P. Buzek and L. Bartak. *Cesk Gastroent Vyz* 22(8):519-525, 1968.

n the last 5 yr 9 patients with regional enteritis were studied nd 3 died. Conservative treatment is recommended for the ystemic manifestations and during relapses after surgery: a atisfactory result may be possible in 10-30% with conservative reatment. Surgery is required for the most frequent complication: intestinal obstruction. Early surgical treatment is necessary before complications arise. Radical surgery may lead to mprovement in many.

3952 **A PSYCHIATRIC STUDY OF PATIENTS WITH REGIONAL ENTERITIS.** *(E.)* Ford, C. V. Naval Hosp., San Diego, Calif.), G. A. Glober and P. Castelnuovo-Tedesco. *JAMA* 208(2):311-315, 1969.

A psychiatric study of 17 white patients (7 males and 10 females, 13-71 yr in age) with regional enteritis is described. Among the patients, 2 were siblings. The diagnosis of regional nteritis had been established by roentgenography in 7 patients nd in the remaining 10 by histological examination of operaive specimens. None was diagnosed as also having ulcerative olitis. Obsessive-compulsive traits and unresolved dependency onflicts were prominent in all patients. These characteristics ften contributed to emotional stresses which precipitated atacks of enteritis. The attacks frequently led to family equilirium changes which alleviated or removed the original stress. Psychologically, the patients with regional enteritis resembled he literature descriptions of those with ulcerative colitis. Simarities include: low sexual interests, rigidity and inhibition n interpersonal relationships, and comparable Minnesota Multiphasic Personality Inventory test data. Mothers of the patients ften were dominant, obsessive-compulsive, and hypochondriacal. t is noteworthy that 9 of the 17 patients with enteritis had a istory of allergic reactions—mostly allergic sinusitis.

3953 **CROHN'S DISEASE.** *(Fr.)* Kestens, P. J. (Clin. U. St. Pierre, Louvain, Belgium), R. Fiasse nd L. Lontie. *Acta Chir Belg* 67(10):1034-1047, 1968.

The complications of Crohn's disease include anal fistulas, bscesses, and peritoneal perforations. Duodenal localization, with resulting difficulty in the differential diagnosis from peptic ulcer, and gastric localization are very rare. Immunouppressing drugs and antilymphocyte serum have been tried in the medical treatment but without any positive effect. Massive doses of corticoids may be tried, but more often surgery is necessary. A frequent complication after extensive ileocolectomy is lithiasis of the kidney. Early surgical treatment is essential, to avoid spreading the lymphatic lesions.

3954 **CLINICAL AND SURGICAL EXPERIENCE IN 70 CASES OF CROHN'S DISEASE.** *(Fr.)* Koutny, J. (Notre-Dame Clin., Charleroi, France). *Acta Chir Belg* 67(10):981-1010, 1968.

Seventy patients (31 males and 39 females; aged 15-78 yr) with Crohn's disease were treated surgically between 1946 and 1968: 90% of the patients were anxious and emotional and 11% showed a familial predisposition. Presenting symptoms were: alteration of intestinal transit (90%), abdominal pain (80%), and a deteriorated general condition in 16%. The disease was associated in 37% of the cases with arthralgia, in 30% with cutaneous lesions, in 29% with anal fistula. In 59% the anatomopathological lesions were at the ileum level, in 35% a lesion of the colon was associated, and in 2 cases the colon only was affected. The intestine was reduced in size, with a thick rigid wall and adherences to other parts of the digestive tract. Histologically an inflammatory fibrosclerosis and ulcerations were observed. A total of 101 surgical procedures were performed with only one death. There was recurrence in 27 (42%). Excluding the most recent cases, we find 31 patients in good, 30 in satisfactory, and 10 in poor condition.

3955 **A CONTRIBUTION TO THE KNOWLEDGE OF THE HISTOPATHOLOGY OF THE TERMINAL ILEUM IN ULCERATIVE COLITIS AND REGIONAL ENTERITIS.** *(It.)* Casaccia, M. (Inst. Surg. Pathol., U. Genoa, Italy), P. Alitta and L. Nante. *Rass Arch Chir* 5(6-bis):399-412, 1967.

3956 **REGIONAL ENTERITIS INVOLVING THE DUODENUM: CASE REPORT AND REVIEW OF THE LITERATURE.** *(E.)* Lutz, J. E. (Harper Hosp., Detroit, Mich.). *Harper Hosp Bull* 25(5):281-290, 1967.

3957 **CROHN'S DISEASE. GRANULOMATOUS ENTEROPATHY.** *(E.)* Lassrich, M. A. (U. Child. Clin., Hamburg, Germany). Pp. 317-339 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3958 **REGIONAL ENTERITIS.** *(Por.)* De Souza Ramos, J. L. and J. P. Magalhães. *Folha Med* 57(6):869-895, 1968.

See also: 4044

3959 ENTERIC CALCIUM ABSORPTION IN DISORDERS OF CALCIUM METABOLISM: RESULTS OF AN ORAL TEST WITH LABELED CALCIUM. *(Ger.)* Sadowski, P. (Med. Polyclin., U. Tübingen, Germany) and D. Klaus. *Med Welt* 86(42):2284-2292, 1968.

Plasma and urinary ^{47}Ca were studied in 7 patients (5 with malabsorption syndrome) at various intervals after p.o. administration of 5-15 μC ^{47}Ca and 20 mg carrier CaCl$_2$ in 5 ml water. Plasma ^{47}Ca values were elevated for 4 hr and urinary excretion of both ^{47}Ca and inactive Ca was very low in a 34-yr-old woman with sprue. She had high serum alkaline phosphatase values, a phosphate clearance in the upper normal range, and no evidence of skeletal changes. A 29-yr-old man with exudative enteropathy due to intestinal lymphangiectasis had low plasma ^{47}Ca levels which reached a maximum 3 hr after administration, reduced urinary excretion of both ^{47}Ca and inactive Ca, elevated alkaline phosphatase values, and no signs of osteoporosis. Plasma ^{47}Ca values were normal in 2 of 3 patients with chronic pancreatitis and steatorrhea, but maximum absorption occurred later than normal. Only 1 of the 3 had osteoporosis. A patient who had undergone a gastrectomy 27 yr before and was being treated with vitamin D$_3$ for osteomalacia had very high plasma ^{47}Ca values which persisted for 4 hr, but normal urinary excretion of inactive Ca. Plasma ^{47}Ca levels were normal in another patient who had undergone a gastrectomy 3 yr before.

3960 A STUDY OF INTESTINAL ABSORPTION DURING SOME PARASITOSES. *(It.)* Assumma, M. (Inst. Clin. Tropic. Infect. Dis., U. Rome, Italy), A. De Dominicis and A. Sebastiani. *Fegato* 14(3):325-330, 1968.

Intestinal absorption was studied in 31 patients with various parasitoses and in 19 controls given 7-30 μC of ^{131}I-triolein and ^{131}I-oleic acid p.o., and 30-50 μC ^{131}I-albumin and ^{131}I-polyvinylpyrrolidone i.v. The average fecal excretion of labeled triolein and oleic acid was 0.91% and 0.83%, resp., in the controls, 1.02% and 1.7% in patients with oxyuriasis (3), 1.35% and 3.6% in those with ancylostomiasis (4), 2.68% and 1.18% in those with ascaridiasis (4), 4.33% and 6.8% in those with lambliasis (12), not determined and 4.3% in patients with hymenolepiasis (2). Excretion of labeled albumin and polyvinylpyrrolidone was 1.47 and 0.44%, resp., in the controls, and 2.3 and 1.9% in patients with lambliasis. The absorption deficit was correlated with the irritant and necrotic action of the parasites at the duodenojejunal level.

3961 TREATMENT OF OVERT AND SUBCLINICAL MALABSORPTION IN HAITI. *(E.)* Klipstein, F. A. (U. Rochester Med. Ctr., N. Y.), I. M. Samloff, G. Smarth and E. A. Schenk. *Gut* 10(4):315-322, 1969.

Twenty-three residents of rural Haiti who were found to have malabsorption, which was associated with overt symptoms of intestinal disease in 8 and subclinical in 15, have been treated with folic acid or tetracycline, or both. Treatment of 8 patients with overt tropical sprue resulted in cessation of diarrhea in all, weight gain in 5, reversal of jejunal morphological abnormalities in all 8, and increased xylose absorption in 4. The hemoglobin concentration rose in 7, the serum albumin rose in 3, and the serum cholesterol concentration rose to normal in 5. Similar therapy in the 15 subjects with subclinical malabsorption, 7 of whom had protein deficiency, gave similar results. The response of the intestinal lesion to therapy appeared to be related principally to the severity of the pretreatment morphological abnormality rather than to the presence or absence of overt manifestations of intestinal disease. The intestinal abnormalities observed in asymptomatic residents and in patients with protein deficiency in areas where tropical sprue is endemic are, in some instances at least, related to the lesion of tropical sprue in that both respond favorably to similar therapy.

3962 FECAL TRIGLYCERIDES. II. DIGESTIVE VERSUS ABSORPTIVE STEATORRHEA. *(E.)* Thompson, J. B. (Oklahoma City VA Hosp., Okla.), C. K. Su, R. E. Ringrose and J. D. Welsh. *J Lab Clin Med* 73(3):521-530, 1969.

Total fecal fat analysis and fecal triglyceride (TG) determinations were made in 14 patients with steatorrhea, due to pancreatic insufficiency, in 19 patients with steatorrhea due to intestinal disease and in 17 subjects without steatorrhea. A significantly greater fraction of the fecal fat from the pancreatic (digestive) steatorrhea group was in the triglyceride form when compared with the fecal lipids of the intestinal (absorptive) steatorrhea group. Fecal triglyceride measurements distinguish between digestive and absorptive forms of steatorrhea where conventional measures of fecal lipids fail. This distinction may be made with very short stool collection periods when steatorrhea has been established by a suitable detection test. For clinical screening purposes, when careful balance studies are not required, the fecal triglyceride method can be simplified by omitting the photodenisitometry if the reference standard chromatography spots are selected to correspond to a clinically critical fecal triglyceride content. Serial TG determinations on fresh, incubated stool specimens provide data on the effects of fecal lipase on fecal TG by means of timed substrate disappearance. Thus, the measurement of this physiologically significant class of fecal lipids answers several problems in the evaluation of patients with steatorrhea.

3963 PROTEIN-LOSING GASTROENTEROPATHY AND MALABSORPTION ASSOCIATED WITH FACTITIOUS DIARRHEA. *(E.)* Heizer, W. D. (Natl. Inst. Arthritis Metabol. Dis., NIH, Bethesda, Md.), A. L. Warshaw, T. A. Waldmann and L. Laster. *Ann Int Med* 68(4):839-852, 1968.

3964 A CASE OF TROPICAL SPRUE: A BIOLOGICAL STUDY. *(Fr.)* Bernier, J. J., M. Bouvry and P. Duret. *Arch Franc Mal Appar Dig* 58(3):149-162, 1969.

3965 DISRUPTIONS OF PHOSPHORUS AND CALCIUM METABOLISM IN RENAL INSUFFICIENCY. *(Fr.)* Traeger, J. (Antiquaille Hosp., Lyon, France) and P. Zech. *Vie Med* 50(4):315-320, 1969.

3966 THE EFFECTS OF AN EXCESS OF SODIUM PHOSPHATE ON THE HYPOGLYCEMIA IN

11 CASES OF HEREDITARY FRUCTOSE INTOLERANCE. *(Fr.)* Desbuquois, B. (Hosp. Child. Dis., Paris, France), R. Lardinois, C. Gentil and M. Odievre. *Arch Franc Pediat* 26(1):21-35, 1969.

3967 **MALABSORPTION.** *(E.)* Jeffries, G. H. (Cornell U. Med. Coll., New York, N. Y.), E. Weser and M. H. Sleisenger. *Gastroenterology* 56(4):777-797, 1969.

3968 **WHIPPLE'S DISEASE.** *(Pol.)* Batko, B. (Milit. Hosp., Gliwice, Poland) and A. Tarnawski. *Przegl Lek* 23(10):713-715, 1967.

See also: 3720,3959

3969 **CARCINOMA OF THE COLON AND RECTUM.** *(E.)* McSherry, C. K. (New York Hosp.-Cornell Med. Ctr., N. Y.), G. N. Cornell and F. Glenn. *Ann Surg* 169(4):502-509, 1969.

The records of 1625 patients treated for 1654 carcinomas of the rectum and colon during the 30-yr period 1932-1962 showed that 1533 (92.7%) were operated upon and 1043 (63.1%) curative operations were attempted. The presenting symptoms were: changes in bowel habits (constipation and/or diarrhea) in 1213 (73%), abdominal pain in 1075 (65%), weight loss in 945 (57%) and rectal bleeding in 857 (52%). The rectum and rectosigmoid were the most frequent sites of cancer of the large intestine (52.5%). Overall 5-yr survival rate for 1625 patients was 28.9%. Of the 1043 patients subjected to curative operations 485 (46.5%) were alive and without evidence of carcinoma at the end of 5 yr. The extension of carcinoma through the bowel wall and the presence of lymph node metastases were important determinants of survival in patients subjected to curative resections.

3970 **VILLOUS ADENOMAS OF THE COLON, BENIGN OR MALIGNANT?** *(E.)* Olson, R. O. (U. Nebraska Coll. Med., Omaha) and W. C. Davis. *Arch Surg (Chicago)* 98(4):487-492, 1969.

A 17-yr review of colonic neoplasms revealed 97 cases, average age 64.8 yr, with a total of 110 clinically benign villous adenomas. Six of the patients were lost to follow-up which averaged 44 months. There were 22 patients whose adenomas showed microscopic invasion of the muscularis mucosa. Sixteen of these were among the 40 adenomas located above the peritoneal reflection, 35% of all the adenomas proved to be malignant. Bloody stools, abdominal pain, and changes in bowel habits were the most common symptoms, but 24% were asymptomatic. Five of the 27 lesions which were less than 2 cm in size and were located above the peritoneal reflection were malignant. Thirteen of the total 22 carcinomas were papillary. There were concurrent malignancies in 42%. Thirteen patients were treated with a cancer operation with no operative deaths and no deaths due to villous adenomas. There were 8 operative deaths among the patients who had limited procedures, all but 1 of whom had a second neoplasm. Three of the remaining 76 died from metastases after limited procedures. Two others had malignant recurrences. A cancer procedure is recommended for all adenomas above the peritoneal reflection and for malignant adenomas below it.

3971 **CARCINOMA OF THE RIGHT COLON.** *(E.)* Nielsen, J. (Munic. Hosp., Copenhagen, Denmark), I. Balslev and H.-E. Jensen. *Acta Chir Scand* Suppl. (396):106-113, 1969.

A 15-yr review of cancer of the colon revealed 186 cases of carcinoma of the cecum, the ascending colon and the hepatic flexure, which represented 31% of the total large intestine carcinomas. The average age of the patients was 68.1 and 96 were female and 90 male. Abdominal pain and discomfort were the most frequent symptoms in both sexes (92%). A change in bowel habits was present in 62%. The average duration of symptoms was 6-7 months. The tumor could be palpated through the abdominal wall in 112 cases (60%), most frequently (70%), if the tumor was cecal. Sixty-four percent were anemic and 71% demonstrated melena. Roentgenographic studies provided the correct diagnosis in 161 cases (97%). A resection was performed in 74% with a postoperative mortality rate of 12%. Of the inoperable patients (11%) and those in whom explorative or palliative surgery was possible (15%), all died within a year and a half. After a resection for cure 46% lived for more than 5 years, but 11% died from causes other than cancer of the colon.

3972 **POLYPS OF THE COLON.** *(E.)* Andreassen, J. C. (Munic. Hosp., Copenhagen, Denmark). *Acta Chir Scand* Suppl.(396):129-169, 1969.

A clinical and histological study of benign mucosal polyps of the colon and rectum with follow-up examinations with a histological examination of 725 cases of carcinoma of the colon and rectum demonstrates polyp-remnants in otherwise carcinomatous tumors. In 110 patients a total of 181 polyps were demonstrated, out of which 52 were recurrences in loco or new polyps. During the period of examination, 3 carcinomas developed in the polyps. The average observation period of the patients was 4.9 yr during which 27 patients died. The causes of death were examined in all cases. On the basis of histological study, "glandular and epithelial atypism" in colonic polyps was not a sufficient criterion to evaluate the risk of malignant degeneration in a given lesion. Large polyps with an entirely or chiefly villous structure often develop carcinoma, while entirely or chiefly adenomatous polyps rarely develop carcinoma.

3973 **GENETIC PROBLEMS OF EPITHELIAL NEOPLASMS OF THE LARGE BOWEL.** *(It.)* Jori, G. P. (Inst. Pathol. Spec. Med., U. Naples, Italy), G. Mazzacca, A. Di Simone and G. Budillon. *Rass Fisiopat. Clin Ter* 40(1): 28-48, 1968.

In the family of a patient with polypoid adenocarcinoma of the colon, 3 were affected by the same disease (2 dead from cancers of the colon). Of 10 members of the family of a patient with isolated adenomatous polyps of the colon, 6 also had polyps. Of 10 relatives of a patient with adenocarcinoma of the rectum-colon, 7 had malignant neoplasms (4 of the large intestine, 1 of large intestine and of endometrium, 1 of endometrium, 1 of CNS). The families of 38 patients with adenocarcinoma of the large intestine and the families of 100 subjects not affected by neoplasm living in the same geographical area were studied. In the first group of 288 relatives, 21 (7.2%) were dead from cancer of the large intestine; in the second group of 813 patients, 11 (1.3%) were affected by the same disease. The difference between the two is statistically significant ($P < 0.001$).

3974 **DIVERTICULITIS OF THE COLON.** *(E.)* Fenger, C. (Munic. Hosp., Copenhagen, Denmark), K. Nyholm and E. Amdrup. *Acta Chir Scand* Suppl.(396):114-120, 1969.

Of 191 patients treated for diverticulitis during a 17-yr period 112 were women (59%) and 79 (41%) men, 44.5% were more ıan 70 and 6.8% were less than 50 when first admitted. One undred seventeen patients (61%) were treated conservatively, 4 (39%) surgically. The indications for surgery were: perforaon peritonitis or acute intestinal obstruction (35%), suspected ıalignancy (28%), and chronic intractibility (37%). Of 71 paents treated conservatively because of mild to moderate diεrticulitis, 12 were rehospitalized subsequently for mild ymptoms of diverticulitis but none had been operated upon uring up to 5 yr of follow-up. Of the 41 severe cases, 2 died the hospital and 4 died during the first postoperative year, all om unrelated causes. Of the 35 still alive after 1 yr, 4 conıued to have symptoms referable to diverticulitis and 2 reuired operation. All 5 patients with acute severe and comlicated diverticulitis died in the hospital. Of 26 treated by nergency operations, 5 died in the hospital and 3 had perstent diverticular symptoms. Of the 21 patients with susected cancer 3 died postoperatively from unrelated disease ıd 1 had persistent symptoms. Of the 27 with recurrent sease, 2 died of operative complications, 1 died postoperavely due to myocardial insufficiency and 4 had persisting mptoms. Primary resection with an anastomosis had the west incidence of postoperative complications in all those erated upon.

975 CAUSES OF FAILURE IN THE RADIOLOGIC DIAGNOSIS OF CARCINOMA OF THE COLON.

.) Kulicz, A. (Silesian Med. Acad., Zabrze, Poland). *Pol ev Radiol Nuclear Med* 32(4):423-428, 1968.

ıe barium enemas and case histories of 61 patients with rcinoma of the colon confirmed at surgery or autopsy over 13-yr period were reviewed. The tumor sites were as follows: cum (12), ascending colon (5), hepatic flexure (13), transrse colon (4), splenal flexure (3), descending colon (4), gmoid colon (15), and sigmorectal junction (5). The correct agnosis of tumor was made from X-ray in 56 cases. Stenosis ıs present in 21 cases, a filling defect in 17, occlusion in 15 ses, and unclassified changes in 3. In cecal carcinomas the uliflower type of carcinomatous lesion predominated, and the hepatic flexure and sigmoid the circular stenotic form. f the 5 cases not diagnosed by contrast enemas initially, 3 d palpable abdominal tumors for which surgery was performed, 1 had a repeat study which was positive and the her patient's tumor was diagnosed by proctoscopy and paroscopy.

976 THIRTY YEARS OF EXPERIENCE WITH THE SURGICAL TREATMENT OF RECTAL PROAPSES.

(Rus.) Chekan, S. T. *Khirurgiia (Moskva)* 44(12): -103, 1968.

nong 212 operated patients with prolapse of the rectum e author established the presence of two distinctly pronounced rms: 1) prolapse of the mucosa alone, seen in 55 patients d treated chiefly with Whitehead's method, with no relapses er 15 years; 2) prolapse of all layers of the rectal wall, seen 139 cases 17 of which were operated using Zerenin-Kummel ethod, with relapses occurring in 5 patients and serious comications in 3. All forms and degrees of rectal prolapse in ildren should be treated clinically. Only when prolapse is rsistent and does not respond to therapy is surgery indicated. pre-school children Makarovsky's technique–constriction the posterior opening–is preferable; in school-age children proctopexy is the choice. Prolapse of the mucosa of the posterior section of the rectum in some adult patients sometimes responds to clinical treatment. In most adult cases, however, surgical correction of prolapse is necessary, and the sooner surgery is performed, the better and more permanent are the results. Fairly persistent but not progressive prolapse of the mucosa of the posterior rectum with well-preserved functioning of the sphincter is an indication for amputation of the prolapsed mucosa. Internal peritoneal fixation of the rectum was used in patients in whom the upper section of the rectum was invaginated in the ampulla. The method described includes bilateral side ampuloplication with sigmoidopexy (Radzievsky's modification) and was applied in the surgical treatment of 157 patients with prolapse of all rectal wall layers. Recurrence was in 2.6% of the cases during the follow-up period ranging from 3-20 yr. No complications were noted.

3977 THE PROGNOSTIC VALUE OF RADIOLOGIC EXAMINATION OF THE COLON.

(E.) Kulicz, A. (Silesian Med. Acad., Zabrze, Poland). *Pol Rev Radiol Nuclear Med* 32(4):429-430, 1968.

The survival times of 56 patients correctly diagnosed as having carcinoma of the colon from barium enema studies during a 13-yr period were correlated with the type of lesion demonstrated. Thirteen of 17 patients with filling defects were followed 5 yr and there were no survivors. Sixteen of 21 patients with circular stenosis on X-ray were followed 5 yr and 7 were still living. Fourteen of 15 patients with passage obstruction were followed 5 yr and 6 were still alive.

3978 COMPLICATIONS OF COLON DIVERTICULOSIS. RADIOLOGICAL CONSIDERATIONS.

(It.) Smaltino, F. (Radiol. Inst., U. Naples, Italy), A. Gaudieri and A. De Michele. *G Ital Chir* 24(1):39-58, 1968.

Complications of diverticulosis of the colon are generally of an inflammatory nature. In 11 cases the symptomatology and the radiologic picture are described in detail. The clinically observed symptoms are diverticulitis, diverticulo-sigmoiditis, perisigmoiditis, perforations and fistulas. In acute diverticulosis the diverticuli are often seen with irregular borders on X-ray, a hypertonia of the colon and normal mucosa are present. When diverticulitis is associated with acute sigmoiditis the intestine is hypertonic, irregular, with a narrow lumen. Chronic perisigmoiditis is very difficult to distinguish from cancer.

3979 DIVERTICULITIS OF THE COLON.

(E.) Botsford, T. W. (Harvard Med. Sch., Boston, Mass.) and R. M. Zollinger Jr. *Surg Gynec Obstet* 128(6): 1209-1214, 1969.

Experience in 206 patients (87% were older than 50 yr) with diverticulitis over a 17 yr period showed a real mortality rate of 7.8% in those sick enough to need surgery. The 3 major causes of death were sepsis from anastomosis leaks (6), perforation with overwhelming infection or delayed surgical treatment (5), and other systemic disease (5). The 4 deaths from anastomotic leaks in 86 patients with a one stage procedure seem unacceptable considering that there were no similar deaths in the remaining 120 patients while a diverting colonic stoma was functioning. Thereafter, only 1 death occurred from a pulmonary embolus, while the patient was recovering from an anastomotic leak that appeared after closure of the stoma. It is suggested that even minor signs or symptoms of infection after a sigmoid resection should be carefully investigated for anastomotic leaks.

3980 THE CONSERVATIVE TREATMENT OF RECTAL FISTULAS AND RECURRENT ABSCESSES AROUND THE INFLAMED RECTUM WITH TUBERCULOSTATICS. *(Ger.)* Hayduk, A. (8966 Altusried, Allgäu, Germany). *Munchen Med Wschr* 111(4):215-216, 1969.

3981 INTESTINAL PERFORATION DURING PERITONEAL DIALYSIS. [CASE REPORT] *(E.)* Rigolosi, R. S. (Holy Name Hosp., Teaneck, N. J.), J. F. Mahler and G. E. Schreiner. *Ann Intern Med* 70(5):1013-1015, 1969.

3982 SURGERY OF THE COLON: MANAGEMENT AND COMPLICATIONS. *(E.)* Beahrs, O. H. (Mayo Clin., Rochester, Minn.), J. G. Hoehn and W. H. Dearing. *Arch Surg* 98(4):480-486, 1969.

3983 NEONATAL HIRSCHSPRUNG'S DISEASE. *(E.)* Hiller, H. G. (Royal Child. Hosp., Melbourne, Victoria, Australia) and P. McDonald. Pp. 340-351 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3984 THE MOBILE CECUM. *(E.)* Bruns, H. A. (U. Child. Clin., Hamburg, Germany) and M. A. Lassrich. Pp. 352-373 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3985 SURGICAL TREATMENT OF NON-NEOPLASTIC COLOPATHIES. *(Fr.)* Francillon. *J Med Lyon* 50(1156):64-68, 1969.

3986 THE TECHNICAL APPROACH IN THE STUDY OF THE LARGE BOWEL WITH PARTICULAR EMPHASIS ON THE EXAMINATION FOR POLYPS. *(E.)* Welin, S. (Malmo Gen. Hosp., Sweden). Pp. 52-64 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

3987 FAMILIAL POLYPOSIS OF THE LARGE INTESTINE. *(Pol.)* Szklanny, J. (1st Surg. Clin., Acad. Med. Lodz, Poland) and M. Kun. *Pol Tyg Lek* 24(25): 967-969, 1969.

3988 DIFFUSE FAMILIAL POLYPOSIS OF THE LARGE INTESTINE. *(Gr.)* Kavazarakis, N. (Surg. Clin. B, Aristotelian U. Thessalonkia, Greece), C. Sfoungaris, O. Papazoglou and J. Zambakos. *Galenus* 9(6): 327-345, 1967.

3989 A RARE CASE OF SOLITARY GIANT DIVERTICULUM OF THE SIGMOID COLON. *(It.)* Smaltino, F. (Inst. Radiol., U. Naples, Italy), A. Gaudieri and E. Del Vecchio. *G Ital Chir* 23(6):971-979, 1967.

3990 ANAL ULCERATION ASSOCIATED WITH A DISORDER IN HEPATIC FUNCTION. [CASE REPORT] *(Fr.)* Jones, L. (Coventry, England). *Rev Med* 9(8):493-494, 1968.

3991 PRINCIPLES OF A NEW OPERATION FOR RECTAL AGENESIS–"HIGH NONPERFORATED ANUS". *(Fr.)* Nixon, H. H. (Hosp. Sick Child., London, England). *Rev Med* 9(8):541, 1968.

3992 PHLEGMON OF THE CECUM AND ASCENDING COLON, COMPLICATED BY SEROUS PURULENT PERITONITIS. *(Rus.)* Yatsetnyuk, M. N. (Kiev Med. Inst., USSR). *Klin Khir (Kiev)* (5):61, 1968.

3993 PHYSIOLOGY AND PATHOLOGY OF THE APPENDIX. *(Rus.)* Vishnevskii, A. A. (Acad. Med. Sci. USSR, Moscow) and N. N. Fomin. *Khir Anest* 13(2): 3-7, 1968.

3994 CONGENITAL APLASIA OF THE APPENDIX. *(Pol.)* Latosiewicz, Z. (Distr. Hosp., Mońki, Poland). *Pol Przegl Chir* 40(1):81-82, 1968.

3995 TWO APPENDICES IN ONE PATIENT. *(Rus.)* Imnaishvili, B. Ie. (Tiflis Inst. Postgrad. Med., USSR) and R. R. Anakhasian. *Vestn Khir Grekov* 100(6): 121-122, 1968.

3996 AN IRRITABLE COLON. *(Sp.)* Meeroff, M. (Lanus Polyclin., Argentina) and S. Weitzman. *Galicia Clin* 40(8):611-625, 1968.

3997 RESULTS OF A DRUG COMBINATION IN THE TREATMENT OF COLONOPATHY AND GASTRITIS. *(Fr.)* Jadot, T. (Chartreux Clin., Brussels, Belgium). *Bruxelles Med* 48(4):245-252, 1968.

3998 INFLAMMATORY DISEASES OF THE SIGMOID. *(Sp.)* Gonzalez, A. M. *Galicia Clin* 40(3):184-210, 1968.

3999 AGANGLIONOSIS INVOLVING THE ENTIRE COLON AND A VARIABLE LENGTH OF SMALL BOWEL. *(E.)* Frech, R. S. (Washington U. Sch. Med., St. Louis, Mo.). *Radiology* 90(2):249-257, 1968.

4000 FOREIGN BODY IN THE RECTUM. *(E.)* Orr, K. B. (St. George Hosp., Kogarah, New South Wales). *Med J Aust* 1(17):721-723, 1968.

4001 RADICAL RESECTION IN THE TREATMENT OF HEMORRHOIDS. *(Sp.)* Baracco Gandolfo, V. *Acad Peru Cir* 20(1):7-13, 1967.

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LARGE INTESTINE

4003 BOWEN'S DISEASE OF THE ANUS. *(Sp.)* Villagran, A. (Carlos Van Buren Hosp., Valparaiso, Chile) and H. Apablaza. *Rev Med Valparaiso* 20(4):160-161, 1967.

4004 A CLINICAL AND STATISTICAL REVIEW OF 91 CASES OF NEOPLASMS OF THE ANUS AND THE ANAL CANAL. *(Sp.)* Salvadori, B. (Natl. Inst. Study Cure Tumors, Milan, Italy), G. Valentinis and L. Zingo. *Tumori* 53(6):591-600, 1967.

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4006 THE EFFECT OF ELECTROSLEEP ON THE MOTOR FUNCTION OF THE LARGE INTESTINE. *(Rus.)* Smirnov, V. F. (Sci. Res. Lab. Proctol., Minist. Hlth. RSRSR, Moscow, USSR). *Klin Med (Moskva)* 46(2): 114-117, 1968.

4007 THE ROLE OF ERYTHRASMA IN ANAL PRURITUS. *(Fr.)* Bowyer, A. (Guy's Hosp., London, England) and I. McColl. *Rev Med* 9(8):511-512, 1968.

4008 CANINE HISTIOCYTIC ULCERATIVE COLITIS. A CONDITION RESEMBLING WHIPPLE'S DISEASE, COLONIC HISTIOCYTOSIS, AND MALAKOPLAKIA IN MAN. *(E.)* Sander, C. H. (Dept. Pathol., Michigan State U., East Lansing) and R. F. Langhan. *Arch Path (Chicago)* 85(1):94-100, 1968.

4009 COLON INJURIES. *(E.)* Haynes, C. D. (Emory U. Sch. Med., Atlanta, Ga.), C. H. Gunn and J. J. D. Martin Jr. *Arch Surg* 96(6):944-948, 1968.

4010 ISCHEMIC LESION OF THE TRANSVERSE COLON. [CASE REPORT] *(E.)* Calem, W. S. (Jewish Hosp. Brooklyn, N. Y.), M. Gaudiano-Ruiz, R. Pochaczevsky and L. Papadakis. *Arch Surg* 96(6):939-943, 1968.

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4012 REPORT ON 46 CASES OF RECTOSIGMOID MELANOSIS OR NIGROSIS. *(Fr.)* Debray, C. (Bichat Hosp., Paris, France), J. A. Paolaggi, J. Leymarios, E. H. Martin, C. Marche and J. Boisson. *Rev Med* 9(8):513-519, 1968.

4013 SINGLE-LAYER ANASTOMOSIS WITH A SINGLE ROW OF SUTURES IN LARGE INTESTINE SURGERY. *(Por.)* Vasconcelos, E. (Clin. Dis. Dig. Tract, Rio de Janeiro, Brazil), P. Nahas and D. R. Kiss. *Hospital (Rio)* 74(5):1423-1426, 1968.

4014 TWO VERY PARTICULAR CASES OF RECTAL AMEBIASIS. *(Fr.)* Bensaude, A. and A. Vanet. *Rev Med* 9(8):521-522, 1968.

4015 A GOOD DESCRIPTION OF COLONIC POLYPS. [EDITORIAL.] *(E.)* Alvarez, W. C. *Geriatrics* 24(4):85-87, 1969.

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4018 A CASE OF COLON TUBERCULOSIS. *(Jap.)* Ikeuchi, A. (Shinkori Hosp., Osaka, Japan) and K. Osumi. *Med J Mutual Aid Ass* 16(1):83-86, 1967.

4019 RECTAL CARCINOMA AND PREGNANCY: A REVIEW OF 17 CASES. *(E.)* O'Leary, J. A. (Mayo Clin., Rochester, Minn.), J. H. Pratt and R. E. Symmonds. *Obstet Gynec* 30(6):862-867, 1967.

4020 PARASITIC COLOPATHIES. *(Fr.)* Felix, H. (Val-de-Grace Sch. Milit. Hlth., Paris, France). *J Med Lyon* 50(1156):33-47, 1969.

4021 DIVERTICULA OF THE APPENDIX. TWO CASE REPORTS. *(It.)* Marranci, P. L. *Osped Ital Chir* 18(5):443-449, 1968.

4022 MASSIVE RECTAL BLEEDING DUE TO AN INFREQUENT CAUSE: MYELOMA. *(Sp.)* Lentini, J., E. Fornells and R. Ortiz. *Rev Esp Enferm Apar Dig* 27(2):339-344, 1968.

4023 BLEEDING FROM THE COLON AND RECTUM. *(Sp.)* Muñiz Gonzalez, J. *Rev Esp Enferm Apar Dig* 27(2):231-236, 1968.

4024 INTRA- AND EXTRAPERITONEAL RUPTURES OF THE RECTUM. *(Rus.)* Deviatov, V. Ia. (Med. Inst., Tashkent, USSR). *Khirurgiia (Moskva)* 44(10): 76-78, 1968.

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4026 RUPTURE OF THE LEFT COLON IN CLOSED ABDOMINAL TRAUMA. *(It.)* Santoro, A. (Inst. Gen. Clin. Surg., U. Catania, Italy) and M. Zanghi. *Chir Ital* 20(2):277-285, 1968.

4027 ACQUIRED COLON STENOSES. *(E.)* Dietz, M. W. (U. Missouri Sch. Med., Columbia). *Missouri Med* 66(6):423-426, 1969.

4028 FOREIGN BODIES IN THE LARGE INTESTINE. *(Pol.)* Podwinski, A. (3rd Surg. Clin., Silesian Acad. Med., Bytom, Poland) and J. Stadnik. *Wiad Lek* 22(7):615-617, 1969.

4029 THE IRRITABLE COLON SYNDROME AND ITS SUBGROUP "THE REDUNDANT LOOP SYNDROME." A REPORT OF 105 CASES. *(E.)* Salem, S. N. (Amirie Hosp., Kuwait). *J Kuwait Med Ass* 1(1):16-23, 1967.

4030 A CASE OF ACUTE APPENDICITIS IN AN IMMATURE NEWBORN CHILD. *(It.)* D'Avanzo, M. (Inst. Pediat., U. Naples, Italy), G. Mercante and F. Leopardi *Pediatria (Napoli)* 75(4):619-635, 1967.

4031 FUNCTIONAL COLOPATHIES. *(Fr.)* Tolot, P. *J Med Lyon* 50(1156):48-55, 1969.

4032 HERNIA APPENDICITIS IN THE SUCKLING. *(Sp.)* Gonzalez-Utrilla, J. (Pediat. Clin., La Paz City Sanit., Boliva) and J. Monereo. *Cir Ginec Urol* 21(5): 347-350, 1967.

4033 ARE POLYPS OF THE COLON PREMALIGNANT? *(E.)* Behringer, G. E. (Harvard Med. Sch., Boston, Mass.) and J. V. Prohaska. *Postgrad Med* 45(3): 216-219, 1969.

4034 A CASE OF GASTROCOLIC FISTULA DUE TO A NEOPLASM OF THE TRANSVERSE COLON. *(It.)* Pappalepore, N. (Bergamo Gen. Hosp., Italy) and C. Pappalepore. *Osped Ital Chir* 17(1):75-82, 1967.

4035 THREE CASES OF ANO-RECTAL MALFORMATIONS. *(It.)* Gigli, U. (Nicola Giannettasio Munic. Hosp., Rossano, Italy) and C. Tocci. *Clinica (Bologna)* 27(2):115-129, 1967.

4036 CANCER OF THE COLON AND THE RECTUM. *(Sp.)* Matute, A., A. Olivares, C. V. Fernández Cabal and A. Monroy. *Cir Cir* 35(6):639-659, 1967.

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4038 POSTERIOR PROCTOTOMY. *(E.)* Guthorn, P. J. (Jersey Shore Med. Ctr., N. J.) and C. Guzzo. *J Med Soc New Jersey* 64(11):608, 1967.

4039 COLITIS CYSTICA PROFUNDA. *(E.)* Carstens, P. H. B. (U. Louisville Sch. Med., Ky.) and R. Gonzalez. *Acta Path Microbiol Scand* 75(2):273-281, 1969.

4040 SYMPTOMS, DIAGNOSIS AND TREATMENT OF PERITONITIS DUE TO APPENDICULAR PERFORATION. *(Fr.)* Loygue, J. *Rev Prat* 19(4):451-455, 1969.

See also: 3624,3647,3658,3660,3679,3698,3703,3705,3729,3913,3954

4041 **LONG-TERM FOLLOW-UP REGARDING INCONTINENCE CONTROL AFTER TOTAL OR SUBTOTAL COLECTOMY FOR ULCERATIVE COLITIS.** *(Ger.)* Kühlmayer, R. (Allgemeine Poliklinik Stadt Wien, Austria). *Schweiz Med Wschr* 99(25):915-920, 1969.

Between 1951 and 1968 a total of 18 patients in a severely reduced state with weight losses of 14-25 kg were treated with total or subtotal colectomy. In 3 patients with multiple perforation of the colon, total colectomy with final ileostomy was performed; in 15, total colectomy and anastomosis between the terminal ileum or the ascending colon and the diseased stump of the rectum was made. Hospitalization was from 12-28 days. Although the frequency of stools in 10 patients was 5-6 daily, it was reduced to 2-4/day after 3-6 months and 2-3 formed stools/day after 1 yr. Twelve patients have been followed for 2-17 yr; 11 had a nearly normal rectal mucosa and 1 had a mild proctitis. All patients have returned to work and have gained 8-45 kg in weight. There were 4 postoperative deaths, 2 of which occurred in patients with multiple perforation of the colon.

4042 **PROGNOSTIC VALUE OF ESTIMATING SERUM PROTEINS IN CASES OF ULCERATIVE COLITIS IN REMISSION.** *(E.)* De Dombal, F. T. (Gen. Infirm., Leeds, England). *Gut* 10(6):491-496, 1969.

Protein electrophoresis was performed on blood samples obtained from 110 patients (49 males, 61 females), average age 37.8 yr, with proven ulcerative colitis as well as from 38 normal volunteers. A slight fall in the colitis outpatient albumin level and a more prominent rise in the alpha 2 and beta globulin levels when compared to normals. There was no difference in serum gamma globulin levels. Serum protein levels were studied in 82 of the patients in complete remission and compared to those of the 56 who remained in remission for 3 months and the 26 who suffered a relapse. There was no prognostic relationship between the gamma globulin fraction and the subsequent clinical course. All 26 of the patients who later suffered a relapse had raised α_2-globulin levels but only 3 of the 56 patients who remained in remission during 3 months showed an increased α_2-globulin level. The mean α_2-globulin level, however, which was 9.5% in those who were to remain in remission, was 14.1% in those who were to relapse. Serial α_2-globulin studies accurately forecast a relapse of ulcerative colitis in 2 patients chosen at random.

4043 **SKIN LESIONS IN ULCERATIVE COLITIS.** *(E.)* Johnson, M. L. (Cent. Middlesex Hosp., London, England) and H. T. H. Wilson. *Gut* 10(4):255-263, 1969.

Of 415 cases of ulcerative colitis, 20 patients had skin diseases believed to be associated with the underlying bowel disease. A characteristic of the skin lesions was a tendency to necrose and form chronic ulcers of varying morphology. Although 55% (230) of the entire series of 415 were women, 70% (14) of those with skin complications were women. Seven patients had more than one morphological type of skin lesion. Eight women had erythema nodosum the onset of which was associated with exacerbations of the colitis. Seven had a seronegative arthropathy and in one case the nodes ulcerated. Seven women had chronic ulcers (pyoderma gangrenosum). There was no correlation between the extent or severity of the colitis and the extent of the dermatitis; in 1 case the ulcer appeared 2½ yr after proctolectomy. Five patients had papulonecrotic lesions which bore no relationship to the severity of the underlying colitis. Three women developed erythematous plaques (a lesion peculiar to ulcerative colitis) on the shins which ulcerated in several places, but these small ulcers did not coalesce.

4044 **AN EPIDEMIOLOGICAL STUDY OF ULCERATIVE COLITIS AND REGIONAL ENTERITIS AMONG ADULTS IN BALTIMORE. II. SOCIAL AND DEMOGRAPHIC FACTORS.** *(E.)* Monk, M. (Johns Hopkins U. Sch. Med., Baltimore, Md.), A. I. Mendeloff, C. I. Siegel and A. Lilienfield. *Gastroenterology* 56(5):847-857, 1969.

Patients who had been hospitalized with ulcerative colitis and ulcerative proctitis (168), and regional enteritis (69) were interviewed in their homes and compared with a sample from the same geographic area and with a group of 102 patients with "irritable colon" who were interviewed in the same way. The social and economic status of patients with ulcerative colitis and regional enteritis differed from those in the comparison groups. There were no consistent differences in present occupational status; the regional enteritis group had a higher educational attainment. The study groups tended to come from white collar families and were less likely than the comparison groups to be from a rural background. The non-Jews in the study groups were of a more recent foreign background than the controls. Differences in ethnic background were small. The high prevalence of ulcerative colitis and regional enteritis among Jews was not accounted for by the factors studied.

4045 **ROENTGENOLOGICAL ASPECTS OF ULCERATIVE COLITIS.** *(E.)* Eklof, O. (Karolinska Hosp., Stockholm, Sweden). Pp. 374-395 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

4046 **RELATIONSHIP OF CHRONIC ULCERATIVE ESOPHAGITIS TO ULCERATIVE COLITIS.** *(E.)* Christopher, N. L. (U. Michigan Med. Ctr., Ann Arbor), D. W. Watson and E. R. Farber. *Ann Intern Med* 70(5):971-976, 1969.

4047 **IMMUNOGLOBULINS IN NONSPECIFIC ULCERATIVE DISEASE OF THE COLON: A PRELIMINARY REPORT.** *(E.)* Schofield, P. F. (Park Hosp., Davyhulme, Manchester, England), S. D. Deodhar and R. B. Turnbull. *J Roy Coll Surg Edinb* 14(3):157-160, 1969.

4048 **HEMORRHAGIC RECTOCOLITIS.** *(Fr.)* Brette, R. *J Med Lyon* 50(1156):56-63, 1969.

4049 TREATMENT OF ULCERATIVE COLITIS. *(E.)* Bargen, J. A. (U. California Sch. Med., Irvine) and S. O. Aylett. *Postgrad Med* 45(4):176-180, 1969.

4050 TWO CASES OF COLITIS ULCEROSA COMPLICATED BY PERFORATION OF THE INTESTINE. *(Pol.)* Dżurak, W. (2nd Clin. Hosp., Warsaw Acad. Med., Poland). *Pol Przegl Radiol* 31(6):867-874, 1967.

See also: 3445,3955

PANCREAS

4051 **PALLIATIVE CHEMICAL SPLANCHNICECTOMY.** *(E.)* Copping, J. (U. Michigan Med. Ctr., Ann Arbor), R. Willix and R. Kraft. *Arch Surg (Chicago)* 98(4): 418-420, 1969.

Ten cc of 6% phenol was injected into the area of the splanchnic nerves and celiac ganglia for palliation in 13 patients with incurable pancreatic carcinoma verified by surgery. One patient died shortly after surgery, and 2 patients had no antecedent pain. Significant relief of pain (average duration 4 months) was noted by 7 of the other 10 patients. Only 4 of 19 similar patients treated by conventional palliative surgery alone experienced comparable pain relief. Most patients in either group were dead 5 months after surgery. Severe degenerative changes were noted in the sympathetic nerves and ganglia of dogs receiving similar treatment.

4052 **PANCREATODUODENECTOMY FOR PERIAMPULLARY CARCINOMA.** *(E.)* Maki, T. (Tohoku U. Sch. Med., Sendai, Japan), T. Sato, Y. Saitoh and K. Koyama. *J Abdom Surg* 11(7):145-156, 1969.

Follow-up studies were made of 65 patients who underwent pancreatoduodenectomy for periampullary carcinoma. Hospital deaths occurred in 17 of 33 patients operated on before 1959, but in only 3 of 32 operated on after 1960. The mean survival rates after 3 and 5 postoperative yr for periampullary carcinoma were 29.5% and 25.6%, resp. Analyzed according to the origin of the carcinoma, the survival rates at 3 yr were 35.8% and 36.9% in carcinoma of the bile duct and of the papilla of Vater, resp.; the corresponding figures at 5 yr were 27.9% and 36.9%. No patients with carcinoma of the head of the pancreas survived for more than 3 yr; all deaths could be attributed to recurrence. The parameters of liver function related to lipid metabolism gave values within normal limits even at a long period of time after the operation. The ^{131}I-Triolein test was abnormal in 7 of 13 patients studied and the pancreozymin secretin serum enzyme test suggested a disturbance of pancreatic function in 5 of 14 patients. There was no correlation between the length of time after surgery and the degree of impairment of pancreatic function.

4053 **ANNULAR PANCREAS IN THE NEWBORN AND THE INFANT: 12 CASES.** *(It.)* Giacomoni, M. A. (Gen. Surg. Clin., U. Milan, Italy) and D. Bigardi. *Arch Ital Chir* 94(6):889-897, 1968.

Between January 1963 and October 1968, 12 cases (5 male and 7 female) of annular pancreas were seen. Their body weights ranged from 2.2-4.5 kg: only 2 weighed more than 3 kg. Symptoms (biliary vomiting in most cases) appeared early in life: in 9 cases before the 10th day, and on days, 19, 30, and 60, in the other 3. In 11 cases duodenal stenosis was associated with the annular pancreas. Two of the 12 cases were mongoloid, 9 survived surgery, and the 3 who died weighed only 2.2-2.4 kg.

4054 **DIABETES MELLITUS AND CANCER.** *(Ger.)* Grosse, H. *Arch Geschwulstforsch* 33(2):149-156, 1969.

4055 **ANNULAR PANCREAS.** *(Sp.)* Sarrias Batista, A. (Sagrado Corazón Hosp., Spain) and W. Martin Guerra. *An Med [Cir]* 55(1):64-70, 1969.

4056 **CYSTIC FIBROSIS OF THE PANCREAS. (A STUDY IN CELL CULTURE.)** *(E.)* Danes, B. S. (Cornell U. Med. Coll., New York, N. Y.) and A. G. Bearn. *J Exp Med* 129(4):775-791, 1969.

4057 **GENETIC STUDY OF CYSTIC FIBROSIS OF THE PANCREAS USING WHITE BLOOD CELL CULTURES.** *(E.)* Danes, B. S. (Cornell U. Med. Coll., New York, N. Y.), K. M. Foley, S. D. Dillon and A. G. Bearn. *Nature* 222(5194):685-687, 1969.

4058 **UNUSUAL PLEOMORPHIC CARCINOMA OF THE PANCREAS FEATURING PRODUCTION OF OSTEOID.** *(E.)* Kay, S. (Med. Coll. Virginia, Richmond) and J. M. Harrison. *Cancer* 23(5):1158-1162, 1969.

4059 **CLINICAL FORMS OF PANCREAS CANCER.** *(Fr.)* Delluc, G. *Gaz Med France* 76(4):782-787, 1969.

4060 **UROPEPSIN IN CASES OF PANCREATIC TUMOR.** *(Pol.)* Chyliński, J. (1st Clin. Intern. Dis., Acad. Med., Gdańsk, Poland). *Pol Tyg Lek* 24(8):272-273, 1969.

4061 **CLINICAL FEATURES OF MECONIUM ILEUS.** *(Ger.)* Coerper, H. G. (Surg. Clin., U. Heidelberg, Germany), R. Daum and W. C. Hecker. *Bruns Beitr Klin Chir* 215(4):467-480, 1967.

4062 **A RING-SHAPED PANCREAS. CLINICAL ASPECTS AND MORPHOGENETIC CONSIDERATIONS. REPORT OF TWO CASES.** *(It.)* D'Avena, C. (United Hosp., Rome, Italy), A. Gargiulo and M. Tondo. *Osped Ital Chir* 17(3):223-231, 1967.

4063 **HYPOGLYCEMIA ASSOCIATED WITH EXTRAPANCREATIC MESENCHYMAL TUMORS.** *(E.)* Yamagiwa, H. (Mie Prefectural U. Sch. Med., Tsu, Japan), H. Onishi and S. Koyama. *Mie Med J* 17(1):61-71, 1967.

4064 **THE VALUE OF THE RADIOLOGICAL EXAMINATION OF THE STOMACH AND THE DUODENUM IN THE DIAGNOSIS OF PANCREAS CYSTS.** *(Pol.)* Smajkiewicz, L. (Dept. Radiol., Acad. Med., Lublin, Poland). *Pol Przegl Radiol* 31(6):849-855, 1967.

See also: 3663,3674,3693,3718,3722

4065 ETIOPATHOGENIC CONSIDERATIONS ON PANCREATITIS ARISING AFTER GASTRIC RESECTION. *(It.)* Battezzati, M. (Ist. Clin. Chir. Gen., U. Genoa, Italy), G. B. Gemma, E. Berti-Riboli and A. Gramegna. *Gazz Int Med Chir* 73(23):2391-2403, 1968.

Among 26 surgical operations to correct previous gastric resection, 11 patients showed an afferent ansa too long to be the cause of the progressive symptomatology. In 77% of the cases changes in the pancreas were present. Illustrative examples are presented of 2 gastric resections; in both the surgical technique constituted the principal pathogenic cause of pancreatitis. A too long afferent ansa with, at first, hyperactivity and hypertonia of the walls, and, then, hypotonia, impeded the discharge of secretions with resultant storage in that area of the jejunum. The best therapy is surgery to eliminate the conditions favoring the hypertension, which could be the cause of pancreatitis.

4066 HAEMORRHAGIC PANCREATITIS INDUCED BY ELASTASE. *(E.)* Molnár, J. J. (Albert Einstein Coll. Med., New York, N. Y.), I. J. Schneider, S. Tindel, D. Shapira and D. State. *Acta Morph Acad Sci Hung* 16(2):213-221, 1968.

Seventy-five mg of pancreatic elastase in 15 ml of distilled water was infused into the main pancreatic duct of 14 fasting mongrel dogs of both sexes (15-22 kg) following ligation of the accessory duct. Six similar animals received the distilled water only. The 14 elastase-infused dogs revealed hemorrhage, edema and congestion of the pancreas within 1 hr after infusion. Most of the interstitial septa demonstrated these changes throughout the pancreas. In addition to 3 animals which showed gross foci of fat necrosis, 4 more displayed microscopic evidence of fresh peripancreatic fat necrosis. Microscopically, the interstitial septa revealed leukocytic infiltration, the veins were variously swollen and thrombosed, and the linings of the arterial vessels demonstrated varying degrees of dissolution. There were minimal gross and microscopic changes in the controls.

4067 SURGICAL TREATMENT OF CHRONIC PANCREATITIS BY A COMPLETE TRIPLE PANCREATIC AND BILIDIGESTIVE SHUNT. *(Fr.)* Salembier, Y. (Lille, France). *J Chir* 96(6):529-536, 1968.

The pain disappearance in patients, after duodenopancreatectomy, must be attributed more to the shunts that are performed during the operation, than to the removal of the pancreas. For this reason the Whipple's technique for duodenopancreatectomy has been modified: transversal section of the pancreas was performed at isthmus level, instead of total removal. The caudal part of pancreas, the common bile duct, and the stomach were anastomosed with the duodenum. This operation has been performed in 13 patients, with excellent results, and is indicated in diffuse chronic pancreatitis.

4068 ACUTE PANCREATITIS AND DISTURBANCES IN THE METABOLISM OF GLYCOGEN. *(It.)* Conti, E. ("Ca' Granda" Hosp., Milan, Italy). *Chir Ital* 19(6): 1345-1353, 1967.

In 66 cases of acute pancreatitis, hyperglycemia was found in 47 (71%). The total deaths were 20 (30%) and the deaths in the cases of hyperglycemia were 14 (29%). No pre-existent diabetes was found in the histories. Twenty days after onset in the hyperglycemic patients glycemia was: lower than 0.15% in 32 (68%); between 0.15% and 0.2% in 8 (17%); higher than 0.2 in 7 (15%). The glycemic changes below 0.2% usually returned to normal; they are believed to be modifications in glycogen metabolism with recovery when pancreatic damage is reduced.

4069 ACUTE POSTOPERATIVE PANCREATITIS IN BILIARY TRACT AND PANCREAS SURGERY. *(Sp.)* Wilks, A. E. (Gen. San Martin Inst., Natl. U. La Plata, Argentina) and N. Gorostiague. *Rev Argent Cir* 13(1-2-3):5-8, 1967.

Among 2855 operations on the biliary tract and pancreas during a 20-yr period (1948-1967) there were 8 (0.28%) cases of postoperative acute pancreatitis. This complication occurred most frequently after pancreatic biopsies (1 out of 9) and after papillectomy (5 out of 351). Five patients (0.17% of the total number and 62.5% of the groups studied) died. Misdiagnosis included shock, peritonitis and hemorrhage. Clinical findings included shock, severe hypotension (which did not respond to the usual treatment), pain, oliguria, nausea, vomiting and regional ileus. Increased amylase in blood and urine which should not be considered synonymous with pancreas injury was also observed. WBC was between 15,000 and 35,000. Hypocalcemia, which has a prognostic significance was common. The treatment suggested is the same as for primary acute pancreatitis.

4070 THE OPERATIVE TREATMENT OF PANCREATITIS. *(E.)* Frey, C. F. (U. Michigan Med. Ctr., Ann Arbor). *Arch Surg (Chicago)* 98(4):406-417, 1969.

Two hundred and eleven of 306 patients hospitalized during a 10-yr period for pancreatitis were subjected to operation. Gallstones (55), alcohol (106), trauma (10), idiopathic (17), peptic ulcer (8), postoperative (6), afferent loop (3), hyperparathyroid (3), ulcerative colitis (2), and steroid (1) accounted for the pancreatitis in the 211 patients operated upon. Each disease or condition which induced pancreatic inflammation had a distinct character in terms of the age, sex, pathogenesis, prognosis, and appropriate therapy. Thirty of 55 patients operated upon for gallstone pancreatitis had good results as compared with only 1 of 10 treated conservatively. Patients with alcoholic pancreatitis did not benefit from surgery unless there was associated calculous disease. Drainage of a pseudocyst offered a favorable prognosis even in alcoholic pancreatitis. Excisional operations were the only effective means of controlling pain in patients with alcoholism and pancreatitis. Pancreatitis was considered a major factor in the deaths of 22 of the operative group of 211 patients and in 21 of the nonoperative group of 95 patients.

4071 THE MANAGEMENT OF CHRONIC PANCREATITIS. *(E.)* Howat, H. T. (Manchester Royal Infirm., England). *J Roy Coll Surg Edinb* 14(3):147-151, 1969.

4072 **THE USE OF TRASYLOL IN ACUTE PANCREATITIS.** *(Rus.)* Kurbangaleiev, S. M. (I. P. Pavlov 1st Med. Inst., Leningrad, USSR) and O. I. Ieletskaia. *Klin Med (Moskva)* 47(4):63-68, 1969.

4073 **ACUTE PANCREATITIS IN CHILDREN: REPORT OF A PERSONAL CASE.** *(Fr.)* Manassero, J. (Lenval Hosp., Nice, France), J. C. Vaillaud, A. Grinda and R. Eskenasi. *Pediatrie* 24(1):73-78, 1969.

4074 **EXAMINATION OF THE EXTERNAL PANCREATIC SECRETION IN ACUTE AND CHRONIC PANCREATITIS.** *(E.)* Herfort, K., P. Fric, D. Cincibuchova and V. Kalabkova. *Rev Roum Med Int* 4(3):169-174, 1967.

4075 **RELATION BETWEEN THE SALIVARY AND BLOOD AMYLASE LEVELS IN CHRONIC PANCREATITIS: THE POSSIBILITY OF COMPENSATORY SALIVARY AMYLASE SECRETION IN PANCREATIC INSUFFICIENCY.** *(Fr.)* Dechezlepretre, S. (Inst. Pharmacol., Fac. Med., Paris, France). *Bull Acad Nat Med (Paris)* 152(3/4):34-36, 1968.

4076 **ACUTE AND CHRONIC PANCREATITIS: PATHOLOGICAL ANATOMY.** *(Ger.)* Becker, V. (Munic. Hosp., Karlsruhe, Germany). *Aerztl Prax Bild* (4/5):86a-91, 1968.

4077 **THE DIAGNOSIS OF PANCREATITIS FROM THE INTERNIST'S POINT OF VIEW.** *(Ger.)* Heinkel, K. (Bad Cannstatt Hosp., Germany). *Aerztl Prax Bild* (4/5):92a-95, 1968.

4078 **THE DIAGNOSIS OF ACUTE AND CHRONIC PANCREATITIS FROM THE SURGICAL POINT OF VIEW.** *(Ger.)* Müller-Kluge, M. (Munic. Hosp., Karlsruhe, Germany). *Aerztl Prax Bild* (4/5):96a-99, 1968.

See also: 3677

LIVER AND BILIARY TRACT
GENERAL

4079 **RESECTIONAL THERAPY IN MASSIVE LIVER INJURY.** *(E.)* Nemhauser, G. M. (UCLA Sch. Med., Calif.), R. J. Cleveland, J. R. Benfield and J. C. Thompson. *J Trauma* 9(6):537-545, 1969.

During 12 months 28 patients with liver trauma were treated without a fatality. Of these, 16 were secondary to blunt trauma and 12 were penetrating injuries. Left hepatic lobectomy was required in 1 with penetrating injury and the remaining 6 hepatic resections were performed as emergency procedures for blunt trauma. The significant complications were 3 subphrenic abscesses, 1 biliary fistula and 1 intrahepatic arteriovenous fistula. Adequate drainage, biliary tree decompression, and an aggressive use of resection will minimize the mortality and morbidity associated with massive liver trauma.

4080 **ANTIMITOCHONDRIAL ANTIBODIES IN JAUNDICE FOLLOWING DRUG ADMINISTRATION.** *(E.)* Rodriguez, M. (Mount Sinai Sch. Med., New York, N. Y.), F. Paronetto, F. Schaffner and H. Popper. *JAMA* 208(1):148-150, 1969.

Jaundice following drug administration was studied in 22 patients (11 males and 11 females, 26-70 yr of age). Antimitochondrial antibodies were detected by fluorescent antibody technique in the sera of 7 of 9 patients jaundiced after halothane anesthesia, and in 4 of 7 patients jaundiced by chlorpromazine therapy. Antimitochondrial antibodies were not observed in jaundiced patients who received methyldopa (3 patients), aminosalicylic acid, chlorpropamide, and perphenazine (1 patient each). Antimitochondrial antibodies were also not observed in 20 patients jaundiced from viral hepatitis; in 10 patients not jaundiced after halothane administration; in 10 patients not jaundiced by chlorpromazine treatment, and in 52 non-jaundiced, hospital controls. The presence of antibodies may help to differentiate between jaundice caused by viral hepatitis and drug administration.

4081 **BLUNT INJURIES TO THE LIVER: PROBLEMS AND MANAGEMENT.** *(E.)* Balasegaram, M. (Gen. Hosp., Seremban, Malaysia). *Ann Surg* 169(4):544-550, 1969.

Blunt hepatic injuries were treated in 35 patients during a 7-yr period. Diagnosis was difficult and only 17 (48.6%) were diagnosed preoperatively. Associated intra-abdominal and concomitant head, chest, pelvic and skeletal injuries accounted for most of the difficulties. Extensive lacerations or intralobar ruptures of the liver occurred in 17 of the 35 patients. Simple linear or stellate lacerated wounds were treated by drainage or suture, or debridement of the ragged liver edges and suture. Before 1964 extensively lacerated wounds were treated by gauze packing. Three of 5 patients treated thus died, while the other 2 had multiple complications. Since 1964, packing has been abandoned in favor of major resection; 11 patients have undergone that procedure and only 1 died. Hepatic resection is recommended for subcapsular hematomas with intra-lobar rupture of the liver to avoid hepatic necrosis. These injuries can be diagnosed by the injection of methylene blue into the common hepatic duct. The low mortality and morbidity in this series are due to improved care, early surgical intervention and major hepatic resection or adequate removal of devitalized lacerated and injured tissues by debridement.

4082 **LIVER DAMAGE IN HYPOCHLORHYDRIC DYSPEPSIA.** *(It.)* Ceci, V. (Inst. Gen. Clin. Med., U. Rome, Italy), P. Soccorsi, A. Neri, A. Sciacca, V. Di Giacomo and G. Carmenini. *Fegato* 14(3):297-303, 1968.

A clinical study of 188 patients with hypochlorhydric dyspepsia revealed alteration of serum proteins with hypergammaglobulinemia and inversion of the A/G ratio in 46 (24.4%), and hypoproteinemia and hypoalbuminemia in 6 (3.2%). Colloidal lability tests were alterated in 66 (35.1%); Kunkel's test was positive in 42 (63.6%), Wuhrmann's test in 4 (10.6%); Maclagan's test in 3 (4.5%); and Takata-Dohmoto's test in 1 (1.5%). Pathologic urobilinuria was present in 42 (21.3%); hyperbilirubinemia (direct) in 15 (7.9%); microcytic hypochromic anemia in 17 (9%). Hepatomegaly was observed in 93 (49.4%), and was associated with serum protein modification in 13 (6.8%). Needle liver biopsy of hepatomegalic patients showed moderate pleocytosis in the porto-biliary spaces, rare reticuloendothelial proliferation, and lipofuscinic or hemosiderinic deposits. Liver glycogen was normal or increased.

4083 **A CASE OF SARCOIDOSIS WITH HEPATOSPLENIC LOCALIZATION.** *(It.)* Bacci, G. (Inst. Clin. Gen. Med., U. Bologna, Italy), F. B. Bianchi, R. Di Feliciantonio and E. Figus. *Arch Ital Mal Appar Dig* 35(1):71-83, 1968.

Clinical examination of a 56-yr-old male, showed hepatosplenomegaly, remittent fever and slight jaundice. The hematologic picture was normal. Histological examination of hepatic and splenic biopsy material showed a great number of epithelioid cells, few giant cells and absence of caseous necrosis. After excluding the possibility of brucellosis because of the absence of reaction to antibiotics, a negative serum diagnosis, and the possibility of tuberculosis (by a positive Kveim-Nickerson's test and a negative tuberculin test), the sarcoidosis was diagnosed. After cortisone therapy, fever and jaundice disappeared, and the volume of the liver and of the spleen gradually returned to normal.

4084 **LIVER DAMAGE IN GASTRIC AND DUODENAL ULCERS.** *(It.)* Testa, M. (Inst. Clin. Gen. Med., U. Rome, Italy), V. Di Giacomo, V. Ceci, A. Sciacca, A. Neri and P. Soccorsi. *Fegato* 14(3):313-323, 1968.

A study of 116 patients with gastric or duodenal ulcers revealed hepatomegaly in 59 (51%), subjective symptoms of hepatopathy in 16 (14%), slight modifications of the serum proteins in 26 (22.4%), a positive Kunkel's test in 13 (11%) and Wuhrmann's test in 1 (0.8%), urobilinuria in 25 (22.4%), microcytic hypochromic anemia in 7 (6%). Dysproteinemia and associated hepatomegaly were found in 13 (11.2%), dysproteinemia and a positive colloidal lability test in 4 (3.4%). Hepatic biopsy showed pleocytosis in the porto-biliary spaces, rare small parvicellular infiltrations, sometimes evolving towards sclerosis, often an increase in the spaces of Disse, moderate and diffuse reticuloendothelial infiltrations and rare signs of vacuolar and turbid hepatocytic degeneration. Focal centers of steatosis and lipofuscinic infarction, usually centrolobular, were observed in ulcerous patients with poor general trophism. There was no correlation between the entity of hepatic damage and the duration and intensity of peptic disturbances.

4085 **EVALUATION OF THE RESULTS OF CHOLEDOCHODUODENOSTOMY.** *(E.)* Wright, N. L. (Queen's U., Belfast, Northern Ireland). *Brit J Surg* 55(1):33-36, 1968.

The course of 44 patients, 34 females and 10 males, who underwent choledochoduodenostomy for biliary calculous disease (32), bile-duct stenosis (5), pancreatitis (4), or malignant disease (3) during a 15-yr period was reviewed. At follow-up there were 35 surviving and 33 of these were available for reexamination. The longest review period was 12 yr, the shortest 1 yr 2 months. Of 10 patients with cholangitic symptoms preoperatively, 4 continued to have them postoperatively. Two others were affected for the first time postoperatively. Two of the patients with clinical symptoms had normal liver biopsies. Twenty of 22 patients demonstrated contrast patency after barium meals while the other 2 showed gas in the biliary tree. Liver function studies were all normal. Only 2 of the patients had postoperative biliary colic pain, 4 were jaundiced and 6 had postoperative fevers. Of 9 deaths among the original 44, only 1 was due to recurrent obstruction.

4086 **DETECTION OF PORPHYRINS IN BONE IN PORPHYRIA CUTANEA TARDA BY FLUORESCENCE TECHNIQUES.** *(E.)* Czitober, H. (1st Med. Div., U. Vienna, Austria), H. Schnack and F. Wewalka. *German Med Monthly* 13(1):19-23, 1968.

Iliac crest bone and liver biopsies were obtained during life and at autopsy in 16 patients (14 male, 2 female) with porphyria cutanea tarda. Decalcified sections and ground preparations of bone along with liver sections were subjected to fluorescence microscopy using ultraviolet light. In 14 of the 16 cases fluorescent porphyrin was noted in the iliac biopsies (13 during life). In each case porphyrin was noted with varying intensity in the Haversian osteons alone or in the bands and lines of the boney trabeculae of the spongiosa. The extent of the deposits was directly related to the duration of the disease. There were 3 cases with carcinomas (liver, larynx, stomach). In 9 cases liver and bone biopsies showed parallel fluorescence, in 1 case the liver was not fluorescent though the bone was, and in 1 case of recent onset neither fluoresced.

4087 **AMMONIA INTOXICATION IN PATIENTS WITH LIVER DISEASES.** *(It.)* Secchi, G. C. (L. Devoto Industrial Clin., U. Milan, Italy) and A. Rezzonico. *Arch Ital Mal Appar Dig* 35(2):99-122, 1968.

Arterial blood ammonia levels were measured in 256 patients with liver disease, and in 30 controls. The average ammonia levels, expressed in μg/100 ml of plasma, were: in controls 19.60 ± 6.08; in hepatic cirrhosis (64 cases) 34.98 ± 20.42; in advanced hepatic cirrhosis (131 cases) 63.85 ± 21.49; in hepatic coma grades 1 and 2 (31 cases) 99.96 ± 16.61; in hepatic coma grades 3 and 4 (19 cases) 165.10 ± 66.56; and in acute hepatitis (11 cases) 39.72 ± 17.61. The average values of ammonemia in the 10 normal subjects, after injection i.v. of 2.25 mEq/kg body weight of ammonium acetate, reached those of hepatic coma grades 3 and 4. No clinical signs or symptoms of hepatic coma were observed in these subjects; the response to mental tests showed no significant modifications. Arterial blood ammonia levels are increased in hepatic coma but that does not mean that this increase has an exclusive role in the pathogenesis of hepatic coma. The role of ammonia intoxication in this pathogenesis may be connected with some preexistent metabolic alterations.

4088 **CLINICAL EVALUATION OF THE LONG-TERM RESULTS OF 463 OPERATIONS ON THE BILIARY TRACT.** *(It.)* Donini, I. (Gen. Clin. Surg., U. Genoa, Italy), E. Marsili, C. Berretti and P. Salvade. *Rass Int Clin Ter* 47(18):993-1013, 1967.

During a period of 5 yr, 463 operations were performed on the biliary tract: 5.3% of the total surgical procedures. There were 287 simple cholecystectomies (61.9%), 27 cholecystectomies associated with other surgical procedures (5.8%), 45 cholecystectomies with choledochotomy (9.7%), 73 cholecystectomies with choledochotomy and papillotomy (15.7%), 22 choledochoduodenostomies and hepaticoduodenostomies (4.7%) and 9 choledochoduodeno- or cholecystoenterostomies (1.9%). Females predominated 350 (75.5%); most of them were in the 3rd or 4th decade of life. Follow-up was available for 393 patients: 155 (38.3%) were clinically well; 161 (40.9%) suffered from digestive disturbances; 16 (4%) from biliary colic; and 61 (15.5%) from a combination of digestive disturbances and colic. The indications for each type of surgery are given together with the results as determined by interview, clinical examinations, laboratory and radiological studies.

4089 **PORPHYRINS IN BILHARZIAL HEPATIC FIBROSIS.** *(E.)* Khattab, M. (Fac. Med., Cairo U., Egypt), A. M. El Mofty, L. Soliman, S. H. Emara and M. Abdel Aal. *J Trop Med Hyg* 70(12):259-264, 1967.

The pattern of porphyrin metabolism was studied in 18 cases of bilharzial hepatic fibrosis, in 6 cases of other liver diseases, and in 41 normal controls. Of the 18 patients with bilharzial hepatic fibrosis, 13 had associated ascites and hypoalbuminemia (below 3 g%) together with alterations in liver function as evidenced by tests to show severe derangement of the hepatic parenchyma; 5 cases were nonascitic and less affected. All cases of bilharzial hepatosplenic fibrosis with ascites showed a marked increase in urinary coproporphyrin (mean 211.4 μg/liter; range 108.8 to 500.7 μg/liter). The mean value was 38.1 μg/liter. Seven of 13 patients with bilharzial hepatic fibrosis and associated ascites showed some increase in control uroporphyrin. The mean uroporphyrin for this group of 13 patients was 21.6 μg/liter; whereas for the controls it was 4.7 μg/liter. In patients without ascites, findings were within normal limits; however, urinary coproporphyrin was high (mean 82.1 μg/liter). Urinary porphobilinogen showed a slight rise in 10 of the 13 patients with bilhazial hepatic fibrosis. Coproporphyrin in the stools was normal in all groups. Protoporphyrin was slightly elevated in 4 patients (3 ascitic, 1 nonascitic). In 6 nonbilharzial cases of other liver diseases including liver cancer with jaundice and ascites, biliary cirrhosis and jaundice, cancer of the liver without jaundice or ascites, Laennec's cirrhosis with jaundice, posthepatic cirrhosis with jaundice, and Laennec's cirrhosis with diabetes urinary coproporphyrin was at even higher levels than in the bilharzial ascitic group (mean

355.2 μg/liter). Urinary uroporphyrin was elevated in 5 of the 6 patients in this group; coproporphyrin was high in 1 patient, and protoporphyrin high in 3. In cases of decompensated bilharzial hepatic fibrosis with ascites and of parenchymatous liver afflications urinary coproporphyrin and uroporphyrin are demonstrably increased.

4090 ALKALINE PHOSPHATASE ACTIVITY IN HIGH MOLECULAR COMPOUND IN SERUM OF HEPATOBILIARY DISEASES. *(E.)* Akedo, H. (Ctr. Res. Adult Dis., Osaka, Japan), K. Shinkai, N. Horiuchi and K. Omori. *Ann Rep Ctr Adult Dis* 7(1):1-7, 1967.

A large molecular size alkaline phosphatase (L-ALP) was isolated by gel-filtration from the sera of patients with hepatobiliary disease and only occasionally and in small amounts from normals. The greatest amount of specific L-ALP activity was found with hepatomas. L-ALP was found to be a complex of at least lipids and proteins. Leucine aminopeptidase activity was demonstrated along with that of phosphatase within the L-ALP complex. Purified alkaline phosphatase was found to have a much smaller molecular size than L-ALP.

4091 LIVER INVOLVEMENT IN BILIARY COLIC, FUNCTIONAL AND PATHOLOGICAL ASPECTS. *(It.)* Comoli, G. (Ospedale Maggiore, Novaria, Italy). *G Clin Med* 48(12):1348-1376, 1967.

Cholecystography of 101 patients (79 females and 22 males; aged 31-79 yr) with cholelithiasis, showed 93 stones of the gallbladder, 2 stones of the bile duct, 6 painful post-cholecystectomy syndrome. Associated diabetes was found in 12. The liver function was evaluated during the lithiasis crisis, hypoalbuminemia was present in 26%; urobilinogenuria in 16%, and hypoprothrombinemia in 8%. The enzymatic picture revealed increase of SGOT in 40%; SGPT in 46%; alkaline phosphatase in 46%; sorbitol-dehydrogenase in 57%; ornithine-carbamyl-transferase (OCT) in 53%. Jaundice was present in 28%. Increased OCT was found in 60% of those with jaundice. After 10-12 days the enzymatic alteration rapidly returned to normal. Leukocytosis was found in 36%, neutrophilia in 60%; and a slight increase of Katz's index in 54%. The level of immune serum globulin in 15 patients showed an increase of γA in 3 cases, of γG in 1; of γM in none. Needle liver biopsy was performed on 31 patients; histological examination showed anisocytosis of the hepatocytes; steatosis; cytolytic degeneration; necrosis; and inactivation of Kupffer's cells. No specific histological pattern was observed, however, because of the different pathogenic mechanisms involved.

4092 THE USE OF THE LIVER SCAN IN THE TREATMENT OF HEPATIC ABSCESS. *(E.)* Stanford, W. (Wilford Hall USAF Hosp., Lackland AFB, Texas) and A. A. Nielsen. *Milit Med* 134(1):43-46, 1969.

A 10-yr review showed 1 patient with hepatic abscess in 168,194 admissions (0.0006%) before 1965, but 6 patients in 65,198 patients (0.009%) since 1965. The overall incidence for the 10-yr period was 0.003%. Diagnosis was performed with fluoroscopic examination of the chest and liver scan. At fluoroscopy, the hepatic abscess patient had an elevated, but slightly mobile, right diaphragm while the subphrenic abscess patient had an elevated but fixed right diaphragm. The liver scan was used in 5 of 6 patients: in 4 the defect was readily visualized and correlated well with the findings at operation. The fifth patient had multiple, small abscesses, and scanner resolution was insufficient for identification. This patient was explored because of a clinical suspicion of intrahepatic abscess as a wound infection complication of appendectomy. Liver scanning was also useful in the follow-up of these patients, and a illustrating case is presented.

4093 NEONATAL HEPATIC NECROSIS. *(E.)* Ruebner, B. H. (Sch. Med., U. California, Davis), B. S. Bhagavan, A. J. Greenfield, P. Campbell and D. M. Danks. *Pediatrics* 43(6):963-970, 1969.

The rare lesion of hepatic necrosis resembling acute yellow atrophy in the neonatal period is described in 5 infants. The 3 patients who died shortly after birth presented chiefly with hemorrhagic phenomena, while those who survived longer were severely jaundiced. In 4 of the babies there were few surviving hepatocytes apart from a few giant cells. Hemosiderin deposition was present in all cases, focal calcification in 1, and nodule formation in another. Virus studies in 3 cases were negative. Etiology is not clear and may be multiple; the hepatocytic giant cells are similar to those seen in "neonatal hepatitis" but that diesase is itself not an etiologic entity.

4094 DIAGNOSTIC SIGNIFICANCE OF SOME COAGULATION TESTS IN CHRONIC PROGRESSIVE HEPATITIS. EVALUATION OF MEDICAL AND SURGICAL TREATMENT. *(It.)* Barlattani, M. (Inst. Clin. Gen. Surg., U. Rome, Italy), S. Calamaro, P. Pascarella, M. T. Teofili, G. Tucci and L. Vecchi. *Epatologia* 14(3):237-298, 1968.

Studies of coagulation in 73 patients with chronic hepatitis included recalcification tests, evaluations of antithrombin activity, prothrombin activity and thromboelastrograms before and after therapy. Although the hemorrhagic syndrome was present in 48% of the patients examined, coagulation tests were altered in 86%. Microscopic hematuria was present in 56% of the cases, melena in 40%, gingival bleeding in 35%, hematemesis in 26%. After therapy coagulation tests were altered in 37% and hemorrhages were present in 34%. In 20 patients operated on portal hypertension, prothrombin activity and the thromboelastogram were altered in 95% of the cases 20 days after the operation. Antithrombin activity alterations instead were reduced from 95% to 65% of the patients. Numerous tables and references are included.

4095 CHOLECYSTOSTOMY. *(Dut.)* Bast, T. J. (Zuidderziekenhuis, Rotterdam, Netherlands) and H. H. M. de Boer. *Nederl T Geneesk* 112(20):942-945, 1968.

During a ten-year period (1957-1967) a total of 1198 primary operations on the gallbladder and bile ducts were performed. There were 15 cholecystostomies in the series. Indications were: patients severely ill with septic complications of an acute cholecystitis, and those with associated diseases making the surgical risk great. In all 15 cases the inflammatory process subsided, the icterus decreased, and the results were satisfactory. During the early postoperative period 2 patients died of cardiac complications.

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4096 **ANGIOGRAPHY OF THE REGENERATING HUMAN LIVER AFTER EXTENSIVE RESECTION.** *(E.)* Bengmark, S. (Dept. Radiol., U. Göteborg, Sweden), L. Engevik and K. Rosengren. *Surgery* 65(4):590-596, 1969.

4097 **EXCHANGE TRANSFUSIONS IN THE TREATMENT OF HEPATIC COMA.** *(E.)* Gelfand, M. L. (New York U. Med., N. Y.) and L. Sussman. *Bull NY Acad Med* 45(6):528-544, 1969.

4098 **HYPERPREBETALIPOPROTEINEMIA (TYPE IV OF FREDERICKSON) WITH FATTY INFILTRATION OF THE LIVER AND ABNORMAL LIVER FUNCTION TESTS.** *(Fr.)* Schalm, L. and E. D. A. Sindram. *Actualites Hepatogastroent Hotel Dieu* 5(1):B39-B44, 1969.

4099 **PRIMARY LYMPHOCYTIC FOLLICULAR LYMPHOMA OF LIVER. [CASE REPORT]** *(E.)* Torres, A. (VA Hosp., Jefferson Barracks, St. Louis, Mo.). *Cancer* 23(5):1185-1189, 1969.

4100 **GASTRIC IRON BINDING SUBSTANCE (GASTROFERRIN) IN A FAMILY WITH HAEMOCHROMATOSIS.** *(E.)* Deller, D. J. (Dept. Med., U. Adelaide, Australia), R. G. Edwards, G. Dart, C. G. Luke and P. S. Davis. *Aust Ann Med* 18(1):36-42, 1969.

4101 **THE PSYCHIATRIC SYMPTOMS OF HEPATOLENTICULAR DEGENERATION.** *(Ger.)* Kunath, B. (Carl Gustav Carus Med. Acad., Dresden, Germany). *Fortschr Neurol Psychiat* 37(2):91-106, 1969.

4102 **RETENTION AND MAXIMUM CLEARANCE OF BROMSULFONPHTHALEIN BY THE LIVER IN DIABETES MELLITUS AND CHRONIC ALCOHOLISM.** *(Ger.)* von Oldershausen, H. F. (Med. Clin., U. Tübingen, Germany) and R. Herz. *Deutsch Med Wschr* 94(10):491-498, 1969.

4103 **TREATMENT OF ACUTE HEPATIC INSUFFICIENCIES.** *(Fr.)* Paolaggi, J. A. *Vie Med* 50(4):337-341, 1969.

4104 **THE NEUROLOGICAL SYMPTOMS OF HEPATIC ENCEPHALOPATHIES. [CASE REPORT]** *(Ger.)* Lahl, R. (Clin. Neurol. Psychiat., Martin Luther U., Halle/Saale, Germany). *Fortschr Neurol Psychiat* 37(2):77-90, 1969.

4105 **HEMATOGENOUS METASTASIS OF YOSHIDA ASCITES HEPATOMA IN THE CHICK EMBRYO LIVER: ULTRASTRUCTURAL CHANGES IN TUMOR CELLS.** *(E.)* Locker, J. (Dept. Pathol., U. Pittsburgh, Pa.), P. J. Goldblatt and J. Leighton. *Cancer Res* 29(6):1244-1253, 1969.

4106 **TREATMENT OF HEMOCHROMATOSIS.** *(E.)* Spellberg, M. A. (Michael Reese Hosp., Chicago, Ill.). *Gastroenterology* 51(6):516-522, 1969.

4107 **EFFECT OF PLASMA FROM PATIENTS WITH LIVER DISEASE ON RESISTANCE OF RED BLOOD CELLS TO LYSIS BY SAPONIN.** *(E.)* Charache, S. (John Hopkins Hosp., Baltimore, Md.) and S. Margolis. *J Lab Clin Med* 73(6):951-955, 1969.

4108 **PRIMARY LIVER CARCINOMA IN BRISBANE.** *(E.)* Lane, D. (Mater Misericordiae Hosp., Brisbane, Australia). *Med J Aust* 1(5):764-767, 1969.

4109 **FATTY LIVER IN PROTEIN-CALORIE MALNUTRITION.** *(E.)* Truswell, A. S. (Dept. Med., U. Cape Town, S. Africa) and D. L. Hansen. *S Afr Med J* 43(10):280-283, 1969.

4110 **CONGENITAL HEPATIC FIBROSIS: DESCRIPTION OF A CLINICAL CASE.** *(Sp.)* Llausas V., A. (Children's Hosp., Mexico City, Mexico), K. Ambrosius and J. Kumate. *Bol Med Hosp Infant Mex* 26(1):85-92, 1969.

4111 **PORPHYRIA IN THE ADOLESCENT–DIAGNOSIS AND TREATMENT.** *(E.)* Chisolm, J. J. Jr. (Baltimore City Hosp., Md.). *Southern Med J* 62(6):713-718, 1969.

4112 **NUCLEIC ACIDS AND HISTONE CONCENTRATION IN TUMOR-FREE LIVER OF CANCER PATIENTS.** *(E.)* Hoch-Ligeti, C. (VA Ctr., Martinsburg, W. Va.), E. Stutzman, T. J. Brown Jr., H. H. Grantham Jr. and J. M. Arvin. *Cancer* 23(6):1399-1407, 1969.

4113 **A CASE OF PRIMARY LIVER CARCINOMA DEVELOPING IN LIVER WITH CIRRHOSIS SECONDARY TO HEPATITIS (PROBABLY INFECTIOUS).** *(Sp.)* Salas, M., M. (Child. Hosp., Mexico City, Mexico), O. Angulo H. and D. Fernández G. de L. *Bol Med Hosp Infant Mex* 26(1):99-107, 1969.

4114 **TREATMENT OF HEPATIC INSUFFICIENCY WITH HETEROLOGOUS LIVER PERFUSION: PATHOPHYSIOLOGICAL BASES, INDICATIONS, AND METABOLIC-HEMODYNAMIC CHARACTERISTICS OF THE EXPERIMENTAL PREPARATION.** *(It.)* Rossotto, P. (Inst. Spec. Surg. Pathol., U. Ferrara, Italy), G. Motta, A. Guberti, G. F. Azzena and E. Tabone. *Minerva Med* 60(24):1075-1094, 1969.

4115 **THE RADIOLOGICAL APPROACH TO THE DIAGNOSIS OF PORTAL HYPERTENSION.** *(E.)* Auvert, J. (Necker Hosp., Paris, France), J. R. Michel and C. Farge. Pp. 99-136 in *Progress in Pediatric Radiology*, Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

4116 **HEPATIC LOBECTOMY IN CHILDHOOD: EFFECTS OF X-RAY AND CHEMOTHERAPY.** *(E.)* Filler, R. M. (Child. Hosp. Med. Ctr., Boston, Mass.), M. Tefft, G. F. Vawter, C. Maddock and A. Mitus. *J Pediat Surg* 4(1):31-41, 1969.

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4117 **RADIOLOGY IN LIVER DISEASE.** *(E.)* Kreel, L. (Royal Free Hosp., London, England). *Brit J Clin Pract* 23(5):187-205, 1969.

4118 **TREATMENT OF HEPATIC COMA WITH EXCHANGE TRANSFUSIONS.** *(Ger.)* Beck, K. (Med. Clin., U. Freiburg/Breisgau, Germany), T. Noé, M. Matthes, W. Bein and H. Engbring. *Munchen Med Wschr* 111(15):850-854, 1969.

4119 **A SIMPLIFIED METHOD FOR FUNCTIONAL HEPATECTOMY.** *(Ger.)* Poser, W. (Inst. Pharmacol., U. Göttingen, Germany). *Pflueger Arch Ges Physiol* 297(3):196-200, 1967.

4120 **ANOMALOUS COURSE OF THE TERMINAL HEPATIC ARTERY. CASE REPORT.** *(It.)* Tursini, E. (Cittiglio Circolo Hosp., Italy). *Osped Ital Chir* 17(5):521-526, 1967.

4121 **PORTAL HYPERTENSION. ROUND TABLE QUESTIONS ON PORTAL HYPERTENSION.** *(Por.)* Gasparini Filho, S. *Hospital (Rio)* 72(5):1347-1370, 1967.

4122 **PERITONEOSCOPY.** *(E.)* Zoeckler, S. J. (Mercy Hosp., Des Moines, Iowa). *J Iowa Med Soc* 57(9):900-902, 1967.

See also: 3458,3484,3489,3549,3552,3553,3608,3611,3612,3613,3617,3635,3649,3650,3654,3662,3664,3667,3669, 3670,3671,3682,3687,3690,3702,3706,3707,3716,3738,3869,3990,4248

Hepatic Injury

4123 ATYPICAL FORMS OF CHRONIC HEPATITIS. [REPORT OF 5 CASES] *(Rus.)* Voloshchuk, O. A. (Chernovtsy Med. Inst., USSR). *Klin Med (Moskva)* 47(4):75-81, 1969.

4124 DIAGNOSTIC DIFFICULTIES IN A CASE OF LIVER ABSCESS. *(Pol.)* Krasucki, H. (Tuberc. Inst., Warsaw, Poland) and H. Kozakow. *Gruzlica* 37(2):179-182, 1969.

4125 BIOCHEMICAL BASIS AND FEATURES OF ALCOHOLIC LIVER DAMAGE. *(Ger.)* Böhle, E. (1st Med. Clin., U. Frankfurt/Main, Germany). *Z Gastroent* 7(1):1-20, , 1969.

4126 CHARACTERISTICS OF THE APPEARANCE OF THE PROTECTIVE EFFECT OF β-MERCAPTOETHYLAMINE DURING THE FORMATION OF CHROMOSOME ABERRATIONS IN THE LIVER CELLS OF MAMMALS SUBJECTED TO GAMMA-IRRADIATION. *(Rus.)* Nuzhdin, N. I. (Inst. Genet., Acad. Sci. USSR, Moscow) and I. S. Kurnishkov. *Zh Obshch Biol* 26(1):3-13, 1965.

4127 ESTROGENS AND THE LIVER. *(E.)* Gutstein, S. (Dept. Med., Yeshiva U., Bronx, N. Y.), L. H. Bernstein and F. Kern Jr. *Ann Int Med* 68(4):1372, 1968.

4128 CONTROLLED EXERESIS IN THE TREATMENT OF SEVERE HEPATIC TRAUMA. *(It.)* Basso, R. (Catanzaro Munic. Hosp., Italy), E. Rocca and A. Scalfari. *Osped Ital Chir* 17(1):1-15, 1967.

4129 ACUTE NUCLEOLAR MORPHOLOGICAL CHANGE PRODUCED BY DIMETHYLNITROSAMINE IN MOUSE HEPATIC PARENCHYMAL CELLS. *(E.)* Kume, F. (U. Utah Coll. Med., Salt Lake City) and M. Chiga. *Gann* 59(2):151-153, 1968.

4130 ULTRASTRUCTURAL INJURIES IN CONNECTION WITH ACUTE ALCOHOLIC HEPATITIS. *(E.)* Kiessling, K. H. (Stockholm, Sweden). *Rev Int Hepat* 18(2):107-115, 1968.

4131 PRIMARY SYMPTOMLESS TUBERCULOSIS OF THE LIVER. *(Pol.)* Martula, M. (3rd Surg. Clin., Silesian Acad. Med., Bytom, Poland) and M. Luciak. *Pol Przegl Chir* 40(4):349-351, 1968.

4132 A STUDY OF THE EFFECTS OF THIACETAZONE AND ISONIAZID ON HUMAN EMBRYO LIVER CELLS. *(E.)* Cavanagh, P. (London Sch. Hyg. Trop. Med., England) and A. J. Zuckerman. *Tubercle* 49(3):291-293, 1968.

4133 THREE CASES OF LIVER DISTOMIASIS DUE TO *FASCIOLA GIGANTICA* CONTRACTED IN CENTRAL AFRICA. *(Fr.)* Janssens, P. G. (Prince Leopold Inst. Trop. Med., Antwerp, Belgium), A. Fain, P. Limbos, A. De Muynck, R. Biemans, N. Van Meirvenne and P. De Mulder. *Ann Soc Belg Med Trop* 48(6):637-650, 1968.

See also: 3455,3534,3537,3567,3578,3580,3591,3605,3668,3803

4134 **VIRUS-LIKE PARTICLES IN SERA OF PATIENTS WITH INFECTIOUS AND SERUM HEPATITIS.** *(E.)* Hirschman, R. J. (Natl. Inst. Arthritis Metabolic Dis., NIH, Bethesda, Md.), N. R. Shulman, L. F. Barker and K. O. Smith. *JAMA* 208(9):1667-1670, 1969.

Studies in 237 patients in the U.S. and W. Africa with infectious or serum hepatitis are described. Serum samples were collected from 175 patients during the acute and convalescent phases of the illness. In the remaining 62 patients with serum hepatitis serum samples were collected prospectively at weekly intervals following exposure to contaminated blood products. Australia antigen was found in 46 (74%) of the 62 patients. The antigen became detectable within 35-120 days after exposure and persisted for 1 week to 3 months in 42 patients, and more than 10 months in 4 patients. The antigen was also found in 2 of 128 healthy chimpanzees and 1 of 14 healthy gibbons. Immunologically, the antigens found in the sera of patients with infectious or serum hepatitis and in ape sera were identical. Electron microscopy showed the virus-like particles in the patient and ape sera to be morphologically similar. Australia antigen appear to be hepatitis virus, and a single virus group may cause both infectious and serum hepatitis.

4135 **BLOOD ACETOIN AND 2,3-BUTYLENE-GLYCOL IN VIRUS HEPATITIS AND IN LIVER FAILURE.** *(E.)* Gioannini, P. (Dept. Int. Med., U. Siena, Italy), G. Scalise, L. Pippi and C. A. Boggiano. *Panminerva Med* 11(5):248-250, 1969.

The behavior of acetoin and 2,3-butylene-glycol (2 pyruvic acid metabolites) was studied in the venous blood of 16 normal subjects, 17 patients with viral hepatitis, 12 with cirrhosis of the liver and 10 in hepatic coma. Mean concentration values for both substances increased progressively from one group to the next, the highest levels being found in the hepatic coma cases; the differences were statistically significant. In some cases of hepatic coma, increases in first one, and then the other metabolite were observed, a finding that was confirmed by repeated determinations carried out in some instances to follow the course of the neuropsychiatric symptoms attributable to hepatic insufficiency. Increased blood levels of the 2 metabolites were always accompanied by hyperpyruvicemia and hyperlactidemia. The 2 metabolites may be responsible for the neuropsychiatric symptoms seen in hepatic insufficiency.

4136 **MODES OF TRANSMISSION OF HEPATITIS IN MELBOURNE.** *(E.)* Bennett, N. M. (Fairfield Hosp. Communicable Dis., Melbourne, Australia). *Med J Aust* 1(10):510-514, 1969.

Questionnaires completed by 421 patients who were hospitalized for infectious hepatitis during a 1 yr period were analyzed. Most (57%) of the patients were less than 16 yr old, and the greatest number of cases occurred in the age groups 5-9 yr (132), 10-14 yr (71), and 25-29 yr (35). Infectious hepatitis was more prevalent in those parts of the city with higher population densities. Sewage facilities did not appear to be a factor affecting incidence. A higher percentage of New Australians were affected, but this was attributed to their higher general admission rate. A history of contact was elicited in 46%. Children appeared to infect each other and their parents. A number greater than expected of school and hospital personnel were infected. The documentation of infectious hepatitis in families suggested a subclinical rate of 9:1 in preschool children and 3:1 in children attending school. In families in which multiple cases developed, most developed the disease within a 2-week period, and only a small proportion developed the disease in the next 3 months.

4137 **ISOENZYMES IN HEPATITIS.** *(Ger.)* Kleine, F.-D. (Med. Clin., Med. Acad., Magdeburg, Germany). *Deutsch Z Verdau Stoffwechselkr* 28(2/4):197-204, 1968.

The activities of lactate dehydrogenase (LDH), LDH_5, glutamate dehydrogenase, GOT fractions originating from liver cytoplasm and mitochondria were determined in 20 patients with acute viral hepatitis of different degrees of severity. Total LDH activity was elevated in 25% of the patients and LDH_5 activity in 32.3% during the entire course of the infection. For LDH there was a statistically significant correlation between normal total enzyme activity and normal isoenzyme activity. Cytoplasmic GOT was in the normal range in 73.8% of the patients and mitochondrial GOT in 65.4%.

4138 **ISOLATION OF CYTOMEGALOVIRUS FROM THE BLOOD LEUKOCYTES OF A PATIENT WITH POST-TRANSFUSION MONONUCLEOSIS.** *(E.)* Foster, K. M. (Monash U. Dept. Med., Prince Henry's Hosp., Melbourne, Australia) and I. Jack. *Aust Ann Med.* 17:135-140, 1968.

Cytomegaloviremia was demonstrated in an adult female who was suffering from an episode of delayed post-transfusion mononucleosis. She had received a large volume of fresh whole blood 5 weeks previously during treatment of acute hepatorenal failure occurring post-partum which included pig liver perfusion with her blood. There was a rise of complement-fixing antibody during the course of illness to a final titer of 1:512. The virus was isolated from unpurified leukocytes, and again 1 week later from purified blood leukocytes. Antibody titrations were carried out on 8 sets of stored sera from patients with post-transfusion mononucleosis. Changes in antibody titer were consistent with cytomegalovirus infection having occurred in 7 of these patients at the time of post-transfusion mononucleosis.

4139 **ASSESSMENT OF THE EFFECTIVENESS OF GAMMA GLOBULIN FOR THE PREVENTION OF VIRAL HEPATITIS BY MEASURING SERUM TRANSAMINASE (SGOT AND SGPT) LEVELS.** *(It.)* Rubino, F. (Phthisiology Dept., U. Parma, Italy) and S. Gaballo. *Minerva Med* 59(7):309-312, 1968.

Gamma globulins were given to 109 children (0.2 ml/kg) and to 28 adults (0.02 ml/kg) and SGOT and SGPT were repeatedly assayed as a diagnostic test for viral hepatitis. In 7 of the children the transaminase activities were increased with a SGOT/SGPT ratio (De Ritis index) $>$ 1 (average 1.33) before the administration of gamma globulins; they were considered to have an anicteric hepatitis. In all the other patients no modifications of enzyme activity was observed during the following two months. Gamma globulin administration is important to prevent epidemic viral hepatitis.

4140 **ACUTE VIRAL HEPATITIS, GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY, AND HEMOLYTIC ANEMIA.** *(E.)* Clearfield, H. R. (U. Pennsylvania Sch. Med., Philadelphia), J. I. Brody and H. J. Tumen. *Arch Intern Med (Chicago)* 123(6):689-691, 1969.

4141 **DISCUSSION OF THE PAPER BY ROBERT W. McCOLLUM: "THE NATURAL HISTORY OF HEPATITIS."** *(E.)* Sherlock, S. (Royal Free Hosp. Med., London, England). *Bull NY Acad Med* 45(2):138-142, 1969.

4142 **DISCUSSION OF THE PAPER BY SHEILA SHERLOCK: "THE TREATMENT OF HEPATITIS."** *(E.)* Davidson, C. S. (Harvard Med. Sch., Boston, Mass.). *Bull NY Acad Med* 45(2):210, 1969.

4143 **DISCUSSION OF THE PAPER BY JAMES W. MOSLEY AND MILDRED A. KENDRICK: "HEPATITIS AS A WORLD PROBLEM."** *(E.)* Davidson, C. S. (Harvard Med. Sch., Boston, Mass.). *Bull NY Acad Med* 45(2):164-166, 1969.

4144 **VIRAL HEPATITIS. [EDITORIAL.]** *(E.)* McCollum, R. W. (Yale U. Sch. Med., New Haven, Conn.). *JAMA* 208(3):524, 1969.

4145 **PATHOLOGICAL ANATOMY OF VIRAL HEPATITIS: ACUTE PROLIFERATIVE HEPATITIS, ITS COURSE AND SEQUELAE.** *(Ger.)* Bianchi, L. (Inst. Pathol., U. Freiburg/Breisgau, Germany). *Munchen Med Wschr* 111(15):822-829, 1969.

4146 **EPIDEMIOLOGY OF INFECTIOUS HEPATITIS.** *(Ger.)* Anders, W. (Fed. Minist. Hlth., Berlin, Germany). *Munchen Med Wschr* 111(15):829-836, 1969.

4147 **THE TREATMENT OF ACUTE VIRAL HEPATITIS.** *(Ger.)* Heilmeyer, L. (Med. Clin., U. Freiburg/Breisgau, Germany) and K. Beck. *Munchen Med Wschr* 111(15):837-846, 1969.

4148 **INHIBITION OF COLLAGEN SYNTHESIS BY D-PENICILLAMINE IN PATIENTS WITH CHRONIC, AGGRESSIVE HEPATITIS.** *(Ger.)* Alexander, M. (1st Med. Clin., Free U. Berlin, Germany) and M. Kludas. *Munchen Med Wschr* 111(15):847-850, 1969.

4149 **HEPATITIS AND PNEUMONIA ASSOCIATED WITH ECHO VIRUS, TYPE 9, INFECTION IN TWO ADULT SIBLINGS.** *(E.)* Schleissner, L. A. (U. Southern California Sch. Med., Los Angeles) and B. Portnoy. *Ann Int Med* 68(4):1315-1319, 1968.

See also: 3451,3459,3468,3633,3643,3666,4153

4150 **PANCREATIC FUNCTION IN ALCOHOLIC LIVER DISEASE.** *(E.)* Davis, A. E. (Sch. Med., U. New South Wales, Kensington, Australia). *Med J Aust* 1(10):508-509, 1969.

Pancreatic function tests were carried out in 25 patients with alcoholic liver disease. In 5 of the patients with fibrosis of the liver pancreatic function tests were essentially normal. In 20 patients with cirrhosis of the liver, 7 had evidence of chronic pancreatitis as shown by a low volume, low amylase output and a low peak bicarbonate concentration after administration of secretin and pancreozymin. Thirteen had a high volume response. Disturbed pancreatic function is common in patients with alcoholic liver disease.

4151 **FATTY LIVER PRODUCED BY DIETARY DEFICIENCIES: ITS PATHOGENESIS AND POTENTIATION BY ETHANOL.** *(E.)* Lieber, C. S. (Bronx VA Hosp., N. Y.), N. Spritz and L. M. DeCarli. *J Lipid Res* 10(3):283-287, 1969.

Male Sprague-Dawley rats were fed a low-fat diet, deficient in amino acids and choline containing either ethanol or isocaloric amounts of carbohydrate. Dietary deficiencies alone produced a moderately fatty liver after 24 days. The combination of ethanol and dietary deficiencies resulted in enhanced lipid accumulation in only 11 days. The experiment was repeated after the adipose lipids had been marked by feeding oils containing the characteristic fatty acids (linseed oil, containing linolenate, or coconut oil, containing laurate or myristate). The fatty acid composition of the hepatic triglycerides differed markedly in all animals from that of adipose tissue; it had a larger percentage of endogenously synthesized fatty acids and a five times smaller percentage of the marker fatty acids. In addition, ethanol feeding resulted in a greater retention of the marker acids in adipose tissue.

4152 **THE INTRAVENOUS TOLBUTAMIDE TEST AFTER GLUCOCORTICOIDS IN LIVER CIRRHOSIS.** *(Cz.)* Středa, M. (Fac. Gen. Med. Charles U., Prague, Czechoslovakia). *Cas Lek Cesk* 16(44):1172-1173, 1967.

Eighteen patients with liver cirrhosis and 10 healthy controls were given 1 g tolbutamide i.v. with and without a glucocorticoid load. The tolbutamide test was abnormal in 11 (61.2%) of the cirrhotic patients. The mean decrease in glycemia was statistically significantly lower in the cirrhotic patients than in the controls. Pretreatment with cortisone elicited a more significant drop in glycemia in the cirrhotics.

4153 **THE EFFECT OF SOCIAL PHENOMENA ON THE INCREASE OF POST-NECROTIC CIRRHOSIS IN LIMA, CAUSED BY VIRAL HEPATITIS.** *(Sp.)* Vega Rizo Patron, L. (San Fernando Sch. Med., Peru). *An Fac Med Lima* 50(3-4):473-490, 1967.

A comparative statistical study of the incidence of massive necrotic hepatitis, cirrhosis and hepatoma was done from 969 autopsies (31.4% of the deaths) performed between November, 1961 and August, 1966. Of the 120 cases classified as liver disease fatalities, massive necrotic hepatitis accounted for 24, cirrhosis, 36, and hepatoma, 8. Findings were compared with results of previous autopsy studies in the same hospital. In the last 20 yr the increase of massive necrotic hepatitis was from 0.06% to 2.4%. This increase may be related to the emergence of unsanitary areas on the periphery of the city. The predominant type of cirrhosis was post-necrotic (52.8%) perhaps also related to sanitation. The frequency of primary hepatoma was relatively high, and may be related to the proportional increase in cirrhosis.

4154 **CORRELATION BETWEEN GASTRODUODENAL ULCERS AND CIRRHOSIS OF THE LIVER.** *(It.)* Rocchi, V. (Inst. Clin. Gen. Surg., U. Rome, Italy), P. B. Sandonà and V. Ziparo. *Fegato* 14(3):341-360, 1968.

In 11 patients (9 males, 2 females) with liver cirrhosis, peptic ulcers were present. In 6 of them the cirrhosis was clearly related to a progressive infectious hepatitis; in 1, to alcoholism. The ulcers, asymptomatic in 4, were discovered during radiologic studies of esophageal varices or during study of the gastric fundus. In 10 other patients (8 males, 2 females), with acute symptoms of peptic ulcer, clinically asymptomatic, atrophic cirrhosis was present. The diagnosis was based on histologic studies. In all the patients gastrectomy was performed, and in 3 patients a portacaval shunt was also established because of concomitant portal hypertension.

4155 **PRIMARY CANCER OF THE CIRRHOTIC LIVER. INCREASE IN FREQUENCY AND EXAMINATION OF KNOWN AND FOLLOWED-UP CIRRHOTIC PATIENTS.** *(Fr.)* Pequignot, H. (Clin. Med. Propéd., Paris, France), J. P. Etienne, P. Delavierre and J. P. Petite. *Presse Med* 75(51):2595-2600, 1967.

Primary carcinoma of the liver was observed in 37 (10%) of the 373 cirrhotic patients autopsied in the period 1959-1966. Of the 37 patients with a cirrhosis/liver cancer association, 28 were asymptomatic and their presenting clinical symptoms coincided with the terminal phase of malignant degeneration. In 9 the cancer appeared in patients affected by cirrhosis for several years. Cirrhosis was diagnosed in these subjects by ascites (4 cases), hematemesis (2 cases), jaundice (1 case) or was not correlated with clinical symptomatology. In 7 patients a history of alcoholism was verified. The period between diagnosis of cirrhosis and the diagnosis of cancer ranged between 2-6 yr and in 3 cancer was diagnosed only by autopsy. The cancer was concomitant with a splenoportal thrombosis in 5 patients. In 7 cases the tumor was histologically a hepatoma and in 2 cases a hepatocholangioma.

4156 **ALCOHOL DEGRADATION AND BROMSULPHTHALEIN METABOLISM IN ACUTE ALCOHOLIC LIVER DISEASE.** *(E.)* Wilkinson, P. (U. Melbourne, Australia), D. M. O'Day and J. G. Rankin. *Gut* 10(3):241-244, 1969.

To explore the reversible depression of BSP storage associated with prolonged and excessive consumption of alcohol, measurements of the rate of alcohol degradation and the relative storag capacity (S_{BSP}) and biliary excretion maximum for BSP (Tm_{BSP}) were combined in a single infusion procedure in 16 male patients (age 33-57) who had recently been drinking excessive amounts of alcohol. Needle biopsies of the liver were performed on all patients and none was found to have histological evidence of cirrhosis. S_{BSP} and Tm_{BSP} estimations were repeated within 48 hr in three patients without simultaneous ethanol infusion. A wide range of $\bar{S}_{BSP}$ values, varying from 2 to 77 mg/mg/100 ml, was obtained. The BSP values, and alcohol degradation rates were within normal limits. No correlation was found between S_{BSP} and alcohol degradation rate; values for S_{BSP} and $\bar{T}m_{BSP}$ did not change when BSP was infused without ethanol.

4157 **STUDIES OF THE METABOLISM OF ERYTHROCYTES FROM THE SPLENIC ARTERY AND SPLENIC VEIN IN PATIENTS WITH PORTAL HYPERTENSION.** *(Ger.)* Weinreich, J. (Med. Acad., Lubeck, Germany), K. D. Birck and H. W. Schreiber. *Z Gastroent* 7(1):49-58, 1969.

4158 **CIRRHOSIS ASSOCIATED WITH ALPHA-1-ANTITRYPSIN DEFICIENCY: A PREVIOUSLY UNRECOGNIZED INHERITED DISORDER.** *(E.)* Sharp, H. L. (U. Minnesota Hosp., Minneapolis), R. A. Bridges, W. Krivit and E. F. Freier. *J Lab Clin Med* 73(6):934-939, 1969.

4159 **CHRONIC THYROIDITIS IN BUFFALO STRAIN RATS WITH DIETARY-INDUCED CIRRHOSIS.** *(E.)* Reuber, M. D. (Natl. Cancer Inst., Bethesda, Md.). *Brit J Exp Path* 50(1):32-36, 1969.

4160 **CONTRASTING PATTERNS OF ASCITES FORMATION IN HEPATIC CIRRHOSIS.** *(E.)* Witte, M. H. (Washington State U. Sch. Med., St. Louis, Mo.), C. L. Witte, W. R. Cole and P. R. Koehler. *JAMA* 208(9):1661-1666, 1969.

4161 **SPONTANEOUS SPLENO-RENAL ANASTOMOSIS AND CIRRHOSIS OF THE LIVER: REPORT OF A NEW CASE.** *(Fr.)* Dubrisay, J., C. Gillot and D. Mahoudeau. *Arch Franc Mal Appar Dig* 58(3):163-170, 1969.

4162 **A CASE OF ADENOCARCINOMA WITH CIRRHOSIS: AN 18-MONTH FOLLOW-UP OF ITS ANATOMO-CLINICAL COURSE.** *(Fr.)* Bonnet-Eymard, J. and H. Budin. *Lyon Med* 221(7):321-332, 1969.

4163 **THROMBOCYTOPENIA AND ALCOHOLISM.** *(E.)* Post, R. M. (Boston City Hosp., Mass.) and J. F. Desforges. *Ann Int Med* 68(4):1230-1236, 1968.

4164 **TWO CASES OF JUVENILE CIRRHOSIS OF THE LIVER, PROBABLY THE RESULT OF EATING TAPAI RICE.** *(E.)* Rail, G. A. (Cape Town, S. Africa). *Med J Aust* 1(19):810, 1968.

4165 **CHRONIC NEPHRITIS ASSOCIATED WITH LIVER CIRRHOSIS: REPORT OF A CASE WITH AUTOPSY FINDINGS.** *(Jap.)* Miyoshi, S., R. Takagi, H. Iwashita, H. Tani, Y. Hidaka and Y. Ogawa. *Naika* 20(6):1177-1182, 1967.

See also: 3486,3545,3589,3622,3714,4135

4166 **ACUTE CHOLECYSTITIS IN A MUNICIPAL HOSPITAL.** *(E.)* Cafferata, H. T. (U. California Sch. Med., San Francisco), R. J. Stallone and C. W. Mathewson. *Arch Surg (Chicago)* 98(4):435-441, 1969.

A 10-yr review of hospital records revealed 172 patients operated upon for acute biliary tract disease. There were 49 cholecystostomies (28.5%) average age 74.5 yr (Group 1), 63 cholecystectomies (36.5%), and 60 cholecystectomies with choledochostomy (34.8%). The average age for the latter two groups (Group 2) was 62.5 yr. There were 68 men and 102 women (2 patients had 2 procedures each). Fourteen of the 27 operative deaths (15.6% operative mortality) occurred in Group 1. Common duct stones were present in 14 of this group. Empyema, hydrops and perforation were common also. Only 3 patients below the age of 70 died after operation. Most of the patients in both groups were operated upon within 24 hr of admission. Mortality was slightly increased with delay. In 25 of the 40 operative cholangiograms obtained of the Group 2 patients, the duct system was normal. Postoperative cholangiography in 27 Group 1 patients revealed obstruction of the cystic duct in 7 and common duct stones in 8. Five of 51 Group 2 patients were found to have retained stones on T-tube cholangiograms. *E. coli* was the most common organism found in the gallbladder of the 118 (74%) with positive cultures. Septic complications (77%) were the most common cause of death, followed by myocardial infarctions (19%). Mortality in Group 1 was directly related to the duration of symptoms. Of the 24 of 35 survivors in Group 1 for whom follow-up information was available, 21 had further surgery (9 cholecystectomy, 12 common duct exploration).

4167 **CONGENITAL CYSTIC DILATATION OF THE COMMON BILE DUCT.** *(E.)* Hays, D. M. (Children's Hosp. Los Angeles, Calif.), G. N. Goodman, W. H. Snyder and M. M. Woolley. *Arch Surg (Chicago)* 98(4):457-461, 1969.

The clinical course of 10 children, 9 female and 1male, who were hospitalized during a 20 yr period for congenital cystic dilatation of the common bile duct revealed that symptoms developed initially in the first 6 months of life in 5 of the children, while the disease was first recognized in 2 at more than 10 yr. Six of the patients had been jaundiced at some time before the diagnosis of the cyst. In 3 of the infants, diarrhea was noted, and in 2, vomiting, as prominent features of their illness. Abdominal pain was significant in only 2 of the 10 cases. An abdominal mass was palpable in 8 of the infants and hepatomegaly as distinct from a mass was noted in 3. The correct preoperative diagnosis was made in 4 of the last 5 patients seen, 3 of whom were jaundiced. The size of the cysts varied considerably. Six represented a generalized enlargement of a segment of the choledochus, 2 a choledochal diverticulum, and 2 a combination of segment and diverticulum changes. Two of the 3 patients who underwent Roux-en-Y procedures developed anastomotic perforation or stricture (jejunojejunostomy) and the third intestinal obstruction as a result of adhesions.

4168 **BILIARY TRACT OPERATIONS. A REVIEW OF 1000 PATIENTS.** *(E.)* Haff, R. C. (Washington U. Sch. Med., St. Louis, Mo.), H. R. Butcher Jr. and W. F. Ballinger II. *Arch Surg (Chicago)* 98(4):428-434, 1969.

Analysis of the records of 1000 patients who underwent primary operations on the biliary tract for cholecystitis and choledocholithiasis during a 30 month period revealed that 311 had cholecystectomy alone, 278 had cholecystectomy associated with appendectomy, 107 had cholecystectomy and choledochotomy, and 68 had this last procedure with an associated appendectomy. Six patients had cholecystostomies only; 230 had biliary tract surgery associated with other major intra-abdominal procedures (e.g., repair of hiatal hernia, gastrectomy, vagotomy). There were 29 postoperative deaths (2.9%): 8 of which were in the combined major intra-abdominal procedure group. The remaining 21 deaths occurred in the 770 patients with biliary tract operations alone and myocardial disease was the most common cause. There were 526 complications in 380 patients; 203 were minor pulmonary and 141 were mainly urologic infections. There were also 58 wound infections and 23 subphrenic and/or subhepatic abscesses. There were 22 episodes of serious postoperative bleeding. Eight patients had injuries to the bile duct; 11 had retained calculi; and 16 had T-tube complications. Thirty-eight patients were reoperated upon because of complications. There were 44 major postoperative pulmonary complications. The morbidity and mortality from biliary tract operations were considerably less if the patient's condition permitted a delay in surgical intervention until 3 weeks after symptoms subsided. Age, associated disease, leukocytosis, physical findings of a mass or peritoneal irritation, hyperbilirubinemia, and a history of chills and fever all worsene the prognosis. Incidental appendectomy had no effect.

4169 **THE SIGNIFICANCE OF BILIARY PRESSURE IN CHOLANGITIS.** *(E.)* Huang, T. (U. Texas Med. Branch, Galveston), J. A. Bass and R. D. Williams. *Arch Surg (Chicago)* 98(5):629-632, 1969.

Escherichia coli cholangitis was induced in 8 disease-free dogs by direct choledochal instillation of the bacteria 6 weeks after partial surgical obstruction of the common duct. Acute obstruction was then achieved and when the intraductal pressure exceeded 250 mm H_2O bacteremia occurred. Hepatic lymph flow increased proportionately to the severity of the obstruction (24 ml/hr without obstruction to 125 ml/hr with an obstructive pressure of 350 mm H_2O). Bacteria were found in the lymph when the intraductal pressure exceeded 200 mm H_2O. Pressure should be kept below this level during diagnostic procedures. Acute complete obstruction of the infected biliary tract should be relieved promptly.

4170 **THE SHAPE OF THE GALLBLADDER IN CHILDREN AND ITS SIGNIFICANCE IN BILIARY PATHOLOGY.** *(Rus.)* Filippkin, M. A. (F. E. Dzerzhinskii Clin. Hosp. Child. No. 9, Moscow, USSR). *Vestn Rentgen Radiol* 43(1):48-53, 1968.

Abnormal forms of the gallbladder were found in 14 of 100 persons at autopsy. None had any complaints related to the gallbladder during life. A review of 147 cholangiographies of children aged 1-5 yr showed 60 healthy and 87 angiocholecystitis cases. Kinks and stricture were encountered with about equal frequency (12 and 15 cases, resp.). There seems to be no relationship between abnormalities of the gallbladder and the pathological process.

4171 **PROPHYLAXIS AND TREATMENT OF GALLSTONE DISORDERS.** *(Ger.)* Spath, F. (U. Surg. Clin., Graz, Austria). *Wien Klin Wschr* 80(25): 491-494, 1968.

Of 1640 uncomplicated cholecystectomies there were 17 deaths postoperatively (1.03%). Among 629 cholecystectomies with choledochotomy there were 24 deaths (3.8%); among cholecystectomies in the acute stage, 19 deaths (4.3%); among 79 cholecystectomies with perforation, 24 deaths (30.4%). Routinely performed X-ray manometry disclosed gallstones in 25-26% of the series. Optimum time for cholelithiasis surgery is after the first attack; however, some surgeons suggest operating on "silent gallstones".

4172 **PROPHYLAXIS AND TREATMENT OF GALLSTONE DISORDERS.** *(Ger.)* Braunsteiner, H. (Med. Clin., U. Innsbruck, Austria) and S. Platzer. *Wien Klin Wschr* 80(25):495-498, 1968.

Of 112 patients with 'silent', symptomless gallstones, 56 developed symptoms within 10-yr and 28 required surgery. Surgery at the advanced age had a greater risk factor, 1/8 of the patients died. It is concluded that surgery should be performed when "silent" gallstones are detected.

4173 **PERFORATION OF THE GALL-BLADDER.** *(E.)* Essenhigh, D. M. (Radcliffe Infirm., Oxford, England). *Brit J Surg* 55(3):175-178, 1968.

In a 10-yr review of 429 emergency admissions for acute cholecystitis there were 23 (18 females and 5 males) cases of gallbladder perforation, with an average age of 74 (compared with 61 for cholecystitis and 66 for empyema of the gallbladder). The mortality rate for surgical treatment of perforated cholecystitis was 26.6%. All 4 patients who were treated conservatively because of their poor condition died. Free perforation was found in 15 patients (65.6%) of whom 3 died postoperatively (20% mortality). Eight (34.4%) localized perforations were found with 2 postoperative deaths (25%). Bile-stained peritoneal fluid was found in 4 patients out of 98 laparotomies for nonperforated cholecystitis. Only one case of perforation was found in noncalculous disease of the gallbladder. The correct preoperative diagnosis of gallbladder perforation was made in only 4 cases. Because of the high mortality rate associated with perforated cholecystitis immediate surgery is recommended if such a diagnosis is suspected.

4174 **POSTOPERATIVE CHOLANGIOGRAPHY.** *(E.)* Szadkowski, A. (L. Pasteur Hosp., Lodz, Poland) and E. Jankowska. *Pol Rev Radiol Nuclear Med* 22(1):68-72, 1968.

Of 510 patients operated upon for cholelithiasis during a 5-yr period, 241 had sufficient indication to warrant bile duct exploration. Calculi were found in the ducts of 145 cases (28.4% of cholelithiasis operations). Intraoperative cholangiography was not done, but after checking the bile ducts a Kehr drain was placed and cholangiography was performed 10-12 days postoperatively in 192 patients. In 3 patients calculi were found (1.24%). Two were removed by reoperation, one was dissolved using 25% olive oil in chloroform.

4175 **ROENTGEN DIAGNOSIS OF SPONTANEOUS BILIARY-INTESTINAL FISTULAS.** *(E.)* Sitkowski, W. (City Hosp. No. 6, Warsaw, Poland), I. Pronaszko-Rzepecka, J. Szymanowski and K. Wermenski. *Pol Rev Radiol Nuclear Med* 32(4):416-422, 1968.

Roentgenographic examination permitted a correct preoperative diagnosis in 25% of 36 cases of simple and mixed biliary-intestinal fistulas. Of the simple fistulas, biliary-duodenal ones were most frequent (16 cases), followed by biliary-colic (11 cases), biliary-gastric (3 cases), and in 1 case there was a fistula between the gallbladder and small intestine. Orally administered barium suspensions preceded by morphine were found helpful in visualizing the canal of the fistula but pneumatization of the bile ducts occurred more often and was 90% accurate in predicting fistulae.

4176 **THE ACCEPTANCE OF X-RAY MANOMETRY AFTER 25 YEARS.** *(Ger.)* Mättig, H. (Dist. Hosp. St. George, Leipzig, Germany). *Zbl Chir* 93(26):899-907, 1968.

To determine how widely X-ray manometry is used 304 surgical clinics in East Germany were surveyed by questionnaire and 239 replied (78.6%). Preoperative cholangiography was done routinely in 6240 (21.5%) of the 28,950 operations performed each year on the gallbladder and biliary tract; occasionally in 15,328 (52.9%) and never in 7382 (25.6%). Manometry alone was done routinely in 1304 (4.5%) occasionally in 8418 (29.0%), and never in 19,228 (66.5%). X-ray manometry was done routinely in only 1085 (3.75%) and occasionally in 5070 (17.5%) for a total of 6155 procedures per annum or 21.25%. The reasons for the infrequent use of preoperative diagnostic procedures (cholangiography, manometry, and cholangioscopy) were technical unavailability in 45, 96, and 111 clinics, resp.; lack of time in 7, 6, and 5, resp.; lack of personnel in 4, 3, and 2, resp.; and outright rejection of the procedure in 6, 19, and 9, resp.

4177 **ARTERIOGRAPHY IN THE DIAGNOSIS OF GALLBLADDER DISEASE.** *(E.)* Rösch, J. (UCLA Sch. Med., Los Angeles, Calif.), J. H. Grollman and R. J. Stockel. *Radiology* 92(7):1485-1491, 1969.

The celiac and superior mesenteric arteriographic studies of 56 patients with proven primary or secondary gallbladder disease are reviewed. Seven patients with only gallstones did not show any vascular changes. Three patients with hydropic changes due to cystic duct occlusion demonstrated a shortened cystic artery with narrowed and stretched main branches. The gallbladder wall was only faintly opacified as a paper-thin vascularized shell during the capillary phase of filling. With chronic inflammation and shrinkage of the gallbladder in patients with cholecystitis, there was poor vascularization. In subacute cholecystitis, hypervascularity was frequently seen. The capillary phase began early and showed increased density. All of the cancers of the gallbladder were extensive and tumor neovasculature and direct infiltration of arteries were the most common arteriographic findings. In 2 patients with tumor originating in bile ducts of the bilus of the liver the hepatic artery and its bifurcation showed tumor infiltration. Tumor neovasculature was also present. In cancer of the head of the pancreas or papilla of Vater the changes were those of biliary obstruction and hydrops. Compression or thrombosis of the portal vein by the tumor was also present.

4178 CHOLEDOCHODUODENOSTOMY FOR CHOLEDOCHOLITHIASIS. *(Nor.)* Olaussen, T. (Vestfold Cent. Hosp., Norway). *T Norsk Laegeforen* 89(4): 233-235, 1969.

4179 CYSTIC DILATION OF THE COMMON BILE DUCT: CLINICAL, RADIOLOGICAL, AND SURGICAL CORRELATIONS IN 19 CASES. *(Sp.)* Isibasi, A. (Mexican Child. Hosp., Mexico City, Mexico), E. Toussaint Aragõn, F. Beltrán Brown and J. Kumate. *Bol Med Hosp Infant Mex* 26(1):31-41, 1969.

4180 THE "SOLUBILITY" OF GALL STONES IN BILE. *(Ger.)* Holub, K. (Wilhelmina Hosp., Vienna, Austria). *Wien Klin Wschr* 81(7):125-126, 1969.

4181 THE STUDY OF THE GALLBLADDER AND BILIARY DUCTS. *(E.)* Nahum, H. (St. Vincent de Paul Hosp., Paris, France). Pp. 65-95 in *Progress in Pediatric Radiology,* Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

4182 CHOLEDOCHODUODENOSTOMY IN THE TREATMENT OF STENOSIS IN THE DISTAL COMMON DUCT. *(E.)* Farrar, T. (Dept. Surg., U. Tennessee, Memphis), M. W. Painter and R. Betz. *Arch Surg* 98(4):442-446, 1969.

4183 DIAGNOSIS OF CHOLELITHIASIS AND CHOLECYSTITIS WITH SPECIAL REFERENCE TO X-RAY FINDINGS. *(E.)* Matsukura, S. (Nippon Med. Sch., Tokyo, Japan), A. Shirota, M. Miki and G. Fujishima. *Int Surg* 49(2):148-156, 1968.

4184 TRANSOPERATORY CHOLANGIOGRAPHY IN ITS PRIMARY AND SECONDARY STAGES. (IS PRIMARY CLOSING OF THE COMMON BILE DUCT JUSTIFIABLE?) *(Sp.)* Ordóñez Acuña, A. *Cir Cir* 35(1): 11-39, 1967.

4185 TRANSHEPATIC CHOLANGIOGRAPHY. *(It.)* Drago, G. (S. Maria Nuova Main Hosp., Florence, Italy), P. Manneschi and G. Gallenga. *Osped Ital Chir* 17(2): 191-202, 1967.

4186 CARCINOMA ASSOCIATED WITH IDIOPATHIC CHOLEDOCHUS CYST. [CASE REPORT] *(E.)* Hizawa, K. (Tokushima U. Sch. Med., Japan), F. Fukuda, G. Akagi, T. Kitamuro and S. Tao. *Acta Path Jap* 17(1):101-106, 1967.

4187 CHOLANGIO-CHOLECYSTOGRAPHY INTENSIFIED BY GLUCOSE. *(It.)* Crocella, A. (O. Basilewski Surg. Hosp., Florence, Italy), U. Nannelli and S. Bruno. *Osped Ital Chir* 17(2):181-189, 1967.

4188 PRIMARY CARCINOMA OF THE GALLBLADDER. (25 CASES). *(Sp.)* Quilantan A., R., A. Aguillon L. and T. Velazquez. *Cir Cir* 35(2):143-163, 1967.

See also: 3568,3631,3665,3704,3712,3713,3828,3851

GENERAL

4189 A CLINICAL STUDY OF THE PSYCHOSOMATIC ASPECTS OF CANCER. *(E.)* Tenney, V. A. *Asian Med J* 11(12):16-21, 1968.

Following conventional therapy for cancers of various sites in 135 patients (including 21 cases of gastrointestinal carcinoma) the psychiatric evaluation was initiated. The secretive personality was noted in large numbers. Cancer may be a physically expressed psychosis, a separation of the true being of the patient from the him that he presents to the world and lives by. The possible psychosomatic pathways by which the physical disease evolved from the psychic source are presented.

4190 DUODENAL, CHOLECYSTIC AND PANCREATIC CORRELATIONS. *(It.)* Gemma, G. B. (Inst. Clin. Surg., U. Genoa, Italy), E. Berti-Riboli, A. Gramegna and F. Molfino. *Chir Pat Sper* 16(4):371-382, 1968.

Clinical demonstrations of lesions of the pancreas associated with those of the biliary tract, arising from anatomo-functional alterations of the duodenum, are reported. Histological examination showed regressive chronic lesions in the pancreas, and acute lesions in the biliary ducts. In 1, the main pathological condition was probably due to a too large Oddi's sphincterotomy (performed 1 yr before) with a slight duodenal substenosis, caused by the suture of the wall. In another an ulcerous duodenitis caused a substenosis and a consequent duodenal hyperkinesia, associated with a hypotonia of the papilla, that induced the biliary and pancreatic alterations. The reflux of duodenal juice may be the main factor determining these lesions of the pancreas and of the biliary duct.

4191 DERMATITIS HERPETIFORMIS AND THE GASTRO-INTESTINAL TRACT. *(E.)* Marks, R. (St. John's Hosp. Dis. Skin, London, England). *Trans St John Hosp Derm Soc* 54(2):141-147, 1968.

Thirty-four patients with dermatitis herpetiformis (DH) were investigated by Crosby capsule jejunal biopsy and/or gastrointestinal function tests. Bone marrow, peripheral blood and serum studies were also performed. Histology was normal in [illegible], and mild focal (2), partial (19), or subtotal (4) villous atrophy was demonstrated in the other biopsies. Function tests failed to parallel anatomical lesions. Three patients had low serum folic acid and vitamin B_{12} levels before sulphone therapy. Two patients had low B_{12} absorption and 5 had early to moderate megaloblastic marrow changes without peripheral megaloblastosis. There were no severe anemias. Two of the patients with DH also had a frank malabsorption syndrome together with significant jejunal atrophy, DH patients have been found to have jejunal abnormalities prior to sulphone therapy and some patients receiving Dapsone had normal biopsies. Seventeen patients were reinvestigated after a mean of 5.8 months on a gluten-free diet. The jejunal biopsies showed improvement in 13, deterioration in 1, and no change in 2. Twelve of the 17 were able to diminish their dose of Dapsone. Four of 6 patients with diarrhea were improved and 13 patients were gaining weight. There was no improvement in function tests. One-third of the patients had lower IgM levels and in the 2 investigated by descending jejunal biopsies there was progressive improvement.

4192 HAEMOPERITONEUM IN THE NEWBORN. *(E.)* Cywes, M. B. (U. Capetown, S. Africa). *Z Kinderchir* 5(Suppl.):48-62, 1968.

Seventeen of 52 infants (35 male, 17 female) with hemoperitoneum during a 10 yr study period were studied retrospectively, while the remaining 35 were studied prospectively for etiology and clinical management. Hemoperitoneum most commonly (73%) occurred between the second and fifth days with the highest incidence on the second day of life. Half the cases presenting on the first day were premature. The sites of bleeding were the liver (32), spleen (5), suprarenal (8), kidney (4), gastrointestinal (2), and liver and spleen (1). Twenty-five (48.1%) of the newborns were over 8 pounds and 8 (15.6%) were less than 5 pounds. Eight of 40 adequate obstetrical histories revealed some difficulty in delivery. A clinical diagnosis of hemoperitoneum was made in 40 of the 52 on the basis sudden pallor, followed by grunting respirations. There was abdominal distention in 38 and 12 of the 40 were found to be bleeding elsewhere. The site of bleeding was localized in 32 (80%) by supine and erect X-rays which demonstrated an opaque mass displacing the air-filled bowel. The hemoglobin on admission was below 8 g% in 30. All the patients had hypoprothrombinemia and 25 were jaundiced. Hypoglycemia was present in 12 cases. All 17 patients in the retrospective study were treated conservatively and came to autopsy. Fifteen of 20 infants survived when treated with blood transfusion and vitamin K followed by surgery if bleeding persisted (12 required surgery which was in each case successful). Only 1 of 4 cases treated with vitamin K, transfusion and immediate surgery survived. One of 11 patients treated with surgery only after transfusion, vitamin K and correction of a coagulation defect was completed died. Fresh blood and fresh frozen plasma are recommended as replacement colloids.

4193 GAS GANGRENE IN ABDOMINAL SURGERY. *(E.)* Allcock, E. A. (Dept. Surg., U. Melbourne, Australia). *Aust N Zeal J Surg* 37(3):260-264, 1968.

Four cases of gas gangrene, each with a fatal outcome, associated with intra-abdominal primary foci are reported. Two of these were associated with gangrene of the small bowel, one was associated with perforation of a duodenal ulcer and the only case which was thought to have developed after surgery followed a partial gastrectomy for carcinoma of the stomach. In only 1 case was there time to administer the recommended polyvalent serum and penicillin. Hyperbaric oxygen therapy and removal of necrotic tissue are also mentioned in the discussion of clostridial toxins and their treatment.

4194 ORAL CHEMOTHERAPY IN AMOEBIC DYSENTERY–POTENTIATING EFFECT OF CHLOROQUINE ON THE ACTION OF DILOXANIDE FUROATE. *(E.)* Nnochiri, E. (U. Lagos Med. Sch., Nigeria). *J Trop Med Hyg* 70(9):224-228, 1967.

Two matched encapsulated drug combinations each containing 187.5 mg of diloxanide furoate and 125 mg tetracycline hydrochloride and one also containing 50 mg chloroquine phosphate (Formulas B and A, resp.) were tested in 108 hospitalized patients (96 cases of proved intestinal amebiasis and 12 cases of bacillary dysentery). Three separate dosage regimens were used; treatment lasted for 5, 7 and 10 days. After treatment each patient was seen weekly for 7 weeks; stool examinations made; patients whose specimens were negative had followed-up stool examinations 3 and 6 months after treatment. Results showed that both formulas in a 5-day course of treatment were effective against bacillary dysentery. Both formulas were unsatisfactory in a 5-day course of treatment of acute intestinal amebiasis. Formula A was more effective than B in the 7-day and 10-day courses of treatment. The formula containing chloroquine (Formula A) may be better than the Formula B in treating acute intestinal amebiasis.

4195 INCIDENCE OF MULTIPLE PRIMARY CANCERS. II. INDEX CANCERS ARISING IN THE STOMACH AND LOWER DIGESTIVE SYSTEM. *(E.)*

Schottenfeld, D. (Memorial Hosp. Cancer, New York, N. Y.), J. W. Berg and B. Vitsky. *J Nat Cancer Inst* 43(1):77-86, 1969.

A cohort study of multiple primary cancers of patients treated during 1949-62 for cancers of the stomach and lower digestive system showed that when compared with the New York State incidence rates there was no increase in the number of associated or subsequent cancers of other organs or tissues among the index patients with cancer of the stomach or of the digestive organs proximal to the colon and rectum. Among the 4771 patients with cancer of the colon and rectum, the proportion with previously (1.9%) and synchronously (3.6%) associated multiple primary cancers of the large intestine was 5.5%. The incidence of metachronous multiple primary cancers of the large intestine was 3.5 per year per 1000 patients at risk; a total threefold excess in the observed number of primary cancers of the colon and rectum. In the patients with index cancer in the cecum, the highest ratios were recorded of observed-to-expected cancers in both the large intestine (6.3) and other organs or tissues (2.4). In patients with index carcinomas of the colon and rectum, there were 132 clinically apparent, multiple primary cancers in other organs or tissues, or 1.4 times the expected number. After combining the experiences of patients with colon and rectal cancer, the incidence of breast cancer was significantly increased. In patients with carcinoma of the rectum and rectosigmoid junction the incidence of carcinoma of the urinary bladder was significantly, but explicably, increased. In those patients with carcinoma of the colon, the observed-to-expected ratio for carcinoma of the female genital organs was 2.1–primarily attributable to carcinoma of the endometrium. Similarly, in 921 index patients with primary ovarian carcinoma, there were 2 observed second primary cancers of the large intestine; this two-fold excess was confined to the colon.

4196 ABDOMINAL DRAINAGE. *(E.)*

Gunn, A. A. (Bangour Gen. Hosp., Broxburn, England). *Brit J Surg* 56(4):274-276, 1969.

After major abdominal surgery 227 patients had 2 Redivac drains placed along the inferior surface of the liver to the duodenum and over the right lobe of the liver and left in position for 4 days. The amount drained was less than 200 cc in 135 and those after biliary procedures drained more than those after gastric procedures and with a wider scatter. Posterior superior drainage was in excess of anterior infrahepatic drainage in 125 of 195 patients who had had biliary or gastric procedure. It was the reverse in 53 of the same group and equal in 17 cases. There were a significant number (14) of patients with total drainage in excess of 600 cc with a range up to 4360 cc.

4197 THE ETIOLOGY OF GASTROINTESTINAL PERFORATION IN THE NEWBORN. *(E.)*

Lloyd, J. R. (Wayne State U. Sch. Med., Detroit, Mich.). *J Pediat Surg* 4(1):77-84, 1969.

Eighty-seven newborn patients with gastrointestinal perforations were cared for during a 20-yr period. The site of perforation was: stomach 39 cases (21 died); duodenum 7 cases (6 died); jejunum 2 cases (2 died); ileum 10 cases (7 died); colon 15 cases (10 died); and an indeterminate site 14 cases (4 died). Maternal complications were present in 60.7% and included toxemia (11), vaginal bleeding (7), prolonged labor (14), premature rupture of the membranes (11), unattended delivery (4) and an unusually difficult delivery (4). Forty-nine of the babies experienced an asphyxial episode at the time of delivery, during labor or during the newborn period. An additional 21 were thought to have experienced a significant anoxic or hypotensive episode. Necropsy revealed ischemic lesions in the gastrointestinal tracts of all the newborns studied (43) as well as in other organs. Similar changes were noted in the 13 surgical specimens studied. The average onset of symptoms was 2.6 days after the anoxic episode. Distention with bilious vomiting and free air in the abdomen were typical early findings

4198 PRIMARY LYMPHOMA OF THE GASTROINTESTINAL TRACT. *(E.)*

Bush, R. S. (Princess Margaret Hosp., Toronto, Ont. Canada) and C. L. Ash. *Radiology* 92(6):1349-1354, 1969.

A series of 83 patients (45 men and 38 women) with primary lymphoma of the gastrointestinal tract (in the stomach (40) and small intestine (25)) was divided into 2 groups–the early (involving the gastrointestinal tract alone or the regional nodes only) and the late (all others). The 2-yr recurrence-free rate for the early cases was 51% (23 of 45). Eleven of these patients did not receive postoperative radiation, and in 7 of the 11 recurrent disease had developed or they were dead at 2 yr. At 5 yr, only 7 patients could be evaluated, and 6 of 7 were dead. The remaining 34 patients who did receive postoperative radiation showed a marked lowering of the rate of recurrence. Only 15 out of 34 at 2 yr and 11 of 21 at 5 yr had died or suffered recurrent disease. Of 38 patients in the late group 16% (6 of 38) survived 2 yr without recurrent disease. Of these, 5 had evidence at the time of treatment of only locally extensive disease and no extensive abdominal or systemic spread. These patients had only marginally more extensive disease than the patients classified as having early disease and their rate of control was similar to the early group. Both in early and locally advanced late disease postoperative radiation markedly reduced the risk of intra-abdominal recurrence and appeared to provide long-term control for a large proportion of patients, especially when the primary lesion was removed surgically.

4199 LACTOSE MALABSORPTION AND POSTGASTRECTOMY MILK INTOLERANCE,

ƆUMPING, AND DIARRHOEA. *(E.)* Condon, J. R. (Westminster Hosp., London, England), P. Westerholm and N. C. Tanner. *Gut* 10(4):311-314, 1969.

'ifty postgastric surgery patients with various combinations of milk intolerance, dumping, and diarrhea were studied for actose malabsorption. Milk intolerance and diarrhea were aused by lactose malabsorption in 7 patients who responded o treatment with a lactose-free diet. Milk intolerance was nrelated to flat lactose tolerance tests in 4 patients in whom ymptoms were not precipitated by the ingestion of 40 g of actose a day. In 5 patients with flat lactose tolerance tests he incidence of dumping was unrelated to lactose ingestion nd unaffected by a lactose-free diet. In 1 patient steatorrhea lue to lactose intolerance responded to a lactose-free diet. .actose malabsorption should be excluded in all postgastric urgery patients who develop diarrhea. Patients with milk inolerance who exclude milk and milk-containing foods from heir diet should receive dietary supplements of calcium.

200 SCLERODERMATOUS INVOLVEMENT OF THE STOMACH AND THE SMALL AND LARGE 3OWEL. *(E.)* Peachy, R. D. G. (St. Thomas' Hosp., London, England), B. Creamer and J. W. Pierce. *Gut* 10(4):285-292, 969.

'en cases of scleroderma (9 in women) involving parts of the astrointestinal tract other than the esophagus included 5 paients with radiological evidence of gastric involvement 1 of vhom developed true pyloric stenosis. Small bowel involvenent included upper abdominal symptoms, pseudo-obstruction, hronic or intermittent diarrhea, and malabsorption. Some vere asymptomatic. The large bowel was involved in 5 patients nd 4 of these had constipation, either chronic and intractable r alternating with episodes of diarrhea. In all 4 cases impacted ecal masses in the large bowel led to episodes of partial large owel obstruction. In most cases in which scleroderma inolves the gastrointestinal tract, a history of Raynaud's phenonenon and some evidence of skin involvement precedes the isceral involvement and is of great help in suggesting the nderlying cause of the gastrointestinal symptoms.

201 ROLE OF PARASITES IN THE PATHOGENESIS OF INTESTINAL MALABSORPTION IN HOOKVORM DISEASE. *(E.)* Tandon, B. N. (All-India Inst. Med. ci., New Delhi), R. K. Kohli, A. K. Saraya, K. Ramachandran nd O. Prakash. *Gut* 10(4):293-298, 1969.

'he role of parasites in the pathogenesis of malabsorption was tudied in 67 patients with hookworm disease using the relaionship of d-xylose absorption, fat balance test, and intestinal iopsy abnormalities to ova load and species of parasite as ndicators. Follow-up studies were also carried out in 17 paients to see the effect of 10-68 weeks' persistent hookworm nfestation on absorption and intestinal morphology. Neither he load of infection, nor the species, nor the duration of inestation had any direct causative relationship with the malbsorption syndrome in hookworm disease. Functional and tructural abnormalities had statistically no significant associaion with the ova load or the species of the hookworm, nor ny deleterious effect on the small bowel.

202 GASTROINTESTINAL PROTEIN ALLERGY. IMMUNOLOGIC CONSIDERATIONS. *(E.)* Self, T. W. (Yale-New Haven Med. Ctr., Conn.), T. Herskovic, E. Czapek, D. Caplan, T. Schonberger and J. D. Gryboski. *JAMA* 207(13):2393-2396, 1969.

Stool specimens were examined for precipitating antibodies to milk, soy, and cereal products from 25 children with chronic diarrhea without organic cause. There were 30 age-matched controls without gastrointestinal, respiratory, or allergic symptoms. Results of roentgenographic gastrointestinal examination and absorption studies were normal in 90% of the patients. Malabsorption patterns were present in 3 patients. Precipitating substances to milk, barley, rye, oats, fraction 3 of gluten and soy were present singly or in combination in all of the patients. All patients responded to elimination of the offending antigen by a return to normal bowel habits, weight gain, and elevation of hemoglobin and serum albumin values.

4203 MASSIVE ESOPHAGEAL, GASTRIC AND DUODENAL HEMORRHAGES. *(Ger.)* Geissendörfer, R. (U. Surg. Clin., Frankfurt/Main, Germany) and K. Reeh. *Langenbeck Arch Klin Chir* 320(2/3):81-99, 1968.

Of 441 cases of massive esophageal, gastric or duodenal hemorrhage seen between 1956 and 1966, 81.2% originated in the esophagus, stomach, and duodenum, 3.8% in the colon, and 0.4% in the supraanal region. Hematemesis and melena were the 2 most important presenting symptoms: the latter not apparent in most instances until 12-48 hr. Bright red blood usually originates in esophageal varices while dark red blood comes from an acidic stomach with ventricular ulcer. Acute cases demand contrast X-ray study of the esophagus or even esophagoscopy using a water-soluble contrast agent. Laparotomy is a last resort if bleeding is uncontrolled after 24-36 hr in spite of transfusions. In the 441 cases 43 laparotomies were performed: the source of bleeding was disclosed in all but 3 cases. Esophageal varices accounted for 31.5% of the total. Of the 156 patients who died, heart and circulatory failure was responsible in 81 and hepatic coma in 76.

4204 URINARY TRACT PATHOLOGY ASSOCIATED WITH CONSTIPATION. *(E.)* Shopfner, C. E. (Dept. Radiol., U. Missouri Sch. Med., Kansas City, Mo.). *Radiology* 90(5):865-877, 1968.

Each of the 39 children (aged 5-13) studied had nonorganic constipation of sufficient degree to cause a fecal impaction. None had evidence of neurogenic disease. The incidence of the abnormalities found was: cone-shaped base plate in 26 (66%), elongated urethra in 18 (46%), mural irregularity in 12 (31%), hydronephrosis in 12 (31%), and vesicoureteral reflux in 8 (20%). There is presented an extensive discussion of the etiology of urinary tract pathology found in the patients with inorganic constipation.

4205 PARASITOLOGIC ASPECTS OF *DIENTAMOEBA FRAGILIS*, PATHOGENIC ACTION AND THERAPY. *(Fr.)* Ottilio Machado, J. (Sch. Med., Rio de Janeiro, Brazil), A. Luiz De Pinho, S. Silva and F. J. Rodrigues Gomes. *Boll Soc Path Exot* 61(1):30-35, 1968.

Microscopic examination of the feces of 250 subjects living in the states of Rio de Janeiro and Guanabara revealed in 2 (10 and 12 yr old boys) the presence of *Dientamoeba fragilis,* and in another 6 the association of *Entamoeba coli, Giardia lamblia* and *Iodamoeba butschlii.* The symptoms in *Dientamoeba fragilis* bearing subjects were flatulence, diarrhea and intestinal spasm. Treatment with furozolidone eradicated the lambliasis but was without effect on the amebiasis. Two courses of treatment with acetoamide caused the disappearance of amebiasis in 5 subjects, and the use of glycobiarsol (bismuth glycolylarsanilate) in the remaining 2.

4206 SURGICAL ASPECTS OF INTESTINAL AND PERITONEAL TUBERCULOSIS OBSERVED IN PULMONARY TUBERCULOSIS PATIENTS. FIVE CASES.

(Fr.) Touraine, R. (Fac. Med. U. Lyon, France), J. Vauzelle, M. Rochet and J. P. Bernard. *Rev Lyon Med* 16(19):783-791, 1967.

Case reports are presented of 5 subjects (4 males and 1 female) with associated pulmonary and intestinal tuberculosis. In 1 patient pulmonary tuberculosis was diagnosed 7 months before the appearance of the intestinal lesions, in another patient pulmonary tuberculosis appeared 1 yr after an operation for specific gastrocolic and anal fistulas. In 2 patients pulmonary and abdominal tuberculosis were both discovered during acute abdominal episodes (cecal perforation and double stricture of the small intestine) and in 1 patient an intestinal occlusion was followed by reactivation of a pulmonary process, already considered stabilized. The anatomical and histological diagnosis of intestinal tuberculosis in patients treated with antitubercular antibiotics is difficult.

4207 ZOLLINGER-ELLISON SYNDROME. CLINICAL, BIOLOGICAL AND ANATOMICAL STUDY OF 10 CASES.

(Fr.) Bader, J. P. (Bichat Hosp., Paris, France), S. Bonfils, J. P. Ferrier, M. Dubrasquet, F. Potet, E. Martin, J. P. Thiery and A. Lambling. *Presse Med* 75(53):2709-2713, 1967.

The age range of 10 patients (6 males and 4 females) with Zollinger-Ellison syndrome was 17-65 yr, with a maximum between 40-50 yr. Ulcer symptoms and diarrhea were present in 9 patients and steatorrhea in 5. Ulcers, mainly duodenal, were complicated by hemorrhages in 4 and by perforation in 2. Radiological examination of stomach, duodenum and jejunum showed signs of general inflammation. Normal plicae disappeared. Gastric secretion in 7 patients not surgically treated revealed a free acid concentration of about 100 mEq/liter. This phenomenon was less evident in 3 gastric resectioned patients. In the 7 tested, the urine had gastrosecretagogue activity. During surgery a tumor of the pancreas was found in 5 patients; in 4 other patients presence of a tumor was confirmed only at histological examination. Tumor cells presented the characteristic of A_1 (or D depending on the terminology used) cells in optical and electronic microscopy. Of 5 patients studied, the percentage of A_1 cells in the nonadenotomous islands were 19-32% (they are below 15% in subjects with simple ulcer). Evolution was slow even in 5 patients with lymph node or hepatic metastases. Total gastrectomy with hemipancreatectomy was the best treatment.

4208 INTESTINAL DISORDERS MASQUERADING AS GYNECOLOGIC PROBLEMS. *(E.)*

Schnur, P. L. (Mayo Clin., Rochester, Minn.), R. E. Symmonds and T. J. Williams. *Surg Gynec Obstet* 128(5):1016-1020, 1969.

The clinical course and treatment of 49 patients operated upon during an 11 yr period for intestinal disorders masquerading as gynecologic problems are reviewed. Twenty-five (51%) were inflammatory. Ten of 16 patients with diverticulitis had resections of the unprepared bowel with primary end-to-end anastomoses. In 2 of these patients small incisional abscesses developed. One patient died of a cerebrovascular accident postoperatively. Five patients were closed without resection as the lesion appeared inactive. One patient had an ileoileosigmoidal fistula closed with subsequent stricture formation. None of the 7 preoperative barium studies obtained showed diverticulitis. Five patients were found to have regional enteritis. All underwent resection and 4 are without symptoms on follow-up. Four patients were found to have pelvic abscesses (appendiceal 3, ileal volvulus 1). Appendectomy and resection of the abscess was carried out in 1 patient, the others had resections of the involved bowel. Twenty-two (45%) had malignant tumors. Nine of 11 patients with adenocarcinoma of the colon had sigmoid lesions and 2 had cecal neoplasms. Resection and primary anastomosis were carried out in both of the cecal tumors and 7 of the 9 sigmoid carcinomas. One patient pretreated with antibiotics developed a wound abscess. Six patients are known to have died of their disease subsequently. Also found at operation were intestinal leiomyosarcoma (2), metastatic carcinoma (2), hypernephroma (1), retroperitoneal sarcoma (1), linitis plastica (1), and carcinoma of the gallbladder (1). One patient was found to have a fecalith which was removed as was a peritoneal cyst found in another case.

4209 EVERTING VERSUS INVERTING GASTROINTESTINAL ANASTOMOSES, BACTERIAL LEAKAGE AND ANASTOMOTIC DISRUPTION. *(E.)*

Rusca, J. A. (Louisiana State U. Sch. Med., New Orleans), G. H. Bornside and I. Cohn. *Ann Surg* 169(5):727-735, 1969.

Two experiments testing everting and inverting gastrointestinal anastomoses were performed on mature mongrel dogs weighing 9 to 21 kg. Distal ileum was incised and closed with inverting and everting sutures in 50 animals. *S. marcescens* was injected into the more proximal ileum and the injection site, anastomoses and peritoneum were sampled at 2, 4, 6, 12, and 24 hr after the initial surgery. There was significant initial spillage on injection of the bacteria (15 dogs). There was no significant difference between the leakage at inverted and everted anastomoses (4 vs 10). Perforated and intact pieces of plastic sheeting were then placed about similar anastomoses and compared with and without antibiotic irrigation. Ten of eleven animals with solid-wrapped everting anastomoses developed a fatal peritonitis. Peritonitis occurred in 14 of 17 similar animals when irrigated with antibiotics. With perforation of the wrapping all 7 such animals survived. Antibiotic irrigation of solid wrapped inverting anastomoses was fatal in 2 of 12 cases.

4210 **MASS IN RIGHT UPPER QUADRANT OF THE ABDOMEN.** *(E.)* Kook Sang Oh (Massachusetts Gen. Hosp., Boston). *JAMA* 207(11):2092-2093, 1969.

4211 **GASTROENTEROLOGY.** *(Fr.)* Hillemand, B. *Vie Med* 50(4):359-366, 1969.

4212 **THE INDUCTION OF INTESTINAL TUMORS IN MICE WITH 1,2-DIMETHYLHYDRAZINE.** *(Ger.)* Wiebecke, B. (Inst. Pathol., U. Cologne, Germany), U. Löhrs, J. Gimmy and M. Eder. *Z Ges Exp Med* 149(3):277-278, 1969.

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4214 **NEOMYCIN IN THE TREATMENT OF ACUTE AND PROTRACTED FORMS OF BACTERIAL DYSENTERY.** *(Pol.)* Chrzanowski, J. (Infect. Dis. Clin., Acad. Med., Lódz, Poland), R. Stempien and L. Tomaszewska. *Ann Acad Med Lodz* 9:127-132, 1967.

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4216 **INTESTINAL OCCLUSIONS WITH A FLAT ABDOMEN.** *(Fr.)* Edelmann, G. *Hopital (Paris)* 55(783 bis):693-695, 1967.

4217 **EXTERNAL GASTROINTESTINAL FISTULAS.** *(Sp.)* Obando, R. and G. Cuadros. *Acad Peru Cir* 20(1):27-31, 1967.

4218 **MOTTLED AREAS OF INTRA-ABDOMINAL CALCIFICATION.** *(E.)* Kook Sang Oh, (Massachusetts Gen. Hosp., Boston). *JAMA* 208(3):521-523, 1969.

4219 **A CLINICAL AND LABORATORY STUDY OF ABDOMINAL WOUND CLOSURE AND DEHISCENCE.** *(E.)* Higgins, G. A. Jr. (VA Hosp., Washington, D. C.), J. G. Antkowiak and S. H. Esterkyn. *Arch Surg* 98(4):421-427, 1969.

4220 **EXPLORATION OF THE ABDOMEN.** *(E.)* Degenshein, G. A. (Dept. Surg., State U. New York, N. Y.). *Surgery* 65(4):721-722, 1969.

4221 **MORTALITY FROM ELECTIVE HERNIA REPAIR.** *(E.)* Iles, J. D. H. (Shouldice Surg., Ontario, Canada). *J Abdom Surg* 11(5):87-95, 1969.

4222 **HYDATID DISEASE OF THE PAROTID GLAND.** *(E.)* Greig, D. H. *Proc Canad Otolaryng Soc* 21:238-248, 1967.

4223 **EARLY FEATURES OF INFECTION IN LIGATED LOOPS OF THE RABBIT SMALL INTESTINE INOCULATED WITH *SHIGELLA FLEXNERI* 3a, ENTEROPATHOGENIC *E. COLI, ESCHERICHIA COLI* AND *VIBRIO PARAHAEMOLYTICUS.* THE FIRST REPORT: VARIATION OF BACTERIAL POPULATION SIZE IN LIGATED LOOPS AT VARIOUS INTERVALS AFTER INOCULATION.** *(E.)* Sasaki, S. (Keio U. Sch. Med., Tokyo, Japan), A. Ghoda and H. Yahagi. *Keio Med J* 16(3):101-117, 1967.

4224 **EARLY FEATURES OF INFECTION IN LIGATED LOOPS OF THE RABBIT SMALL INTESTINE INOCULATED WITH *SHIGELLA FLEXNERI* 3a, ENTEROPATHOGENIC *E. COLI, ESCHERICHIA COLI* AND *VIBRIO PARAHAEMOLYTICUS.* THE SECOND REPORT: GROSS APPEARANCE AND HISTOLOGICAL FINDINGS OF LIGATED LOOPS AFTER INOCULATION.** *(E.)* Yahagi, H. (Keio U. Sch. Med., Tokyo, Japan), A. Ghoda and S. Sasaki. *Keio J Med* 16(3):119-131, 1967.

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4228 **THE USE OF "TsOLIPK" PROTEIN HYDROLYSATE IN PATIENTS WITH CHRONIC ENTEROCOLITIS.** *(Rus.)* Al'perin, P. M. (Inst. Nutrit., Acad. Med. Sci. USSR, Moscow), I. S. Savoshchenko, N. I. Iekisenina, A. A. Zamchii, L. M. Krums and O. P. Melikhova. *Klin Med (Moskva)* 47(4):99-103, 1969.

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4235 THE FATE OF SWALLOWED FOREIGN BODIES. EXPERIENCE OF 1250 INSTANCES OF SUB-DIAPHRAGMATIC FOREIGN BODIES IN CHILDREN. *(E.)* Pellerin, D. (Hosp. Child. Dis., Paris, France), M. Fortier-Beaulieu and J. Gueguen. Pp. 286-302 in *Progress in Pediatric Radiology,* Vol. 2. Kaufmann, H. J., Ed. Basel, Karger, 1969. 404 pp.

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4237 THROMBOPHLEBITIS OF THE LOWER EXTREMITIES AND ABDOMINAL NEOPLASMS. *(Pol.)* Panecka, A. (1st Surg. Clin., Acad. Med. Lublin, Poland). *Pol Tyg Lek* 24(25):960-962, 1969.

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4243 SYMPTOMS, DIAGNOSIS AND TREATMENT OF PERITONITIS DUE TO PERFORATION OF THE SMALL INTESTINE AND THE COLON. *(Fr.)* Lagache, G. (Munic. Hosp., Lille, France) and C. Proye. *Rev Prat* 19(4):467-484, 1969.

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4247 *ENTAMOEBA COLI* SENSITIVITY TO CHEMOTHERAPEUTIC AGENTS USED IN THE TREATMENT OF CHRONIC INTESTINAL AMEBIASIS. *(Por.)* De Oliveira, C. A. (Natl. Inst. Rural Endemic Dis., Belo Horizonte, Brazil), G. Chaia and J. R. Da Silva. *GEN* 22(2):83-91, 1967.

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Khilnani, J. Eliasoph and B. S. Wolf. *Amer J Roentgen* 101(2): 379-387, 1967.

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4255 AN EVALUATION OF ERYTHROMYCIN STEARATE IN SUSTAINED-RELEASE CAPSULES IN CHRONIC INTESTINAL AMEBIASIS. *(Sp.)* Tovia Arrioja, F. (Region. Hosp., Mexican Inst. Social Security Puebla, Mexico). *Medicina (Mex)* 47(1019):423-424, 1967.

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4260 LARVA MIGRANS VISCERALIS. *(Pol.)* Mikulowski, W. (2nd Clin. Child. Dis., Krakow, Poland). *Przegl Lek* 23(11):786-788, 1967.

4261 THE AMINO ACID COMPOSITION OF SERUM ALBUMIN IN PATIENTS SUFFERING FROM KWASHIORKOR. *(E.)* Potgieter, G. M. (Dept. Chem. Pathol., U. Cape Town Med. Sch., South Africa), M. Hines and J. E. Kench. *Clin Chim Acta* 18(1):107-116, 1967.

4262 IMMUNOPRECIPITINS IN *SCHISTOSOMA MANSONI* INFECTIONS: I. MOUSE INFECTIONS. *(E.)* Hillyer, G. V. (U. S. Army Trop. Res. Med. Lab., APO 09851 New York, N. Y.) and L. P. Frick. *Exp Parasit* 20(3):321-325, 1967.

4263 IMMUNOPRECIPITINS IN *SCHISTOSOMA MANSONI* INFECTIONS: II. *CERCOPITHECUS SABAEUS* AND *MACACA MULATTA* MONKEYS. *(E.)* Hillyer, G. V. (U. S. Army Trop. Res. Med. Lab., APO 09851 New York, N. Y.) and L. S. Ritchie. *Exp Parasit* 20(3):326-333, 1967.

4264 ACUTE ABDOMEN. SYMPOSIUM AND ROUND TABLE. *(Sp.)* Zuckermann, C. *Cir Cir* 35(6): 661-667, 1967.

See also: 3491,3518,3601,3610

DESCRIPTION OF INDEXES

Starting with Volume 3, Number 1, the SUBJECT and AUTHOR INDEXES have been generated directly from computer-stored files. The Indexes to prior volumes were manually prepared.

The Subject Index uses a system of permuted *major class* terms combined with SEE and SEE ALSO references. A *major class* term is one embracing a broad concept which can be broken down into *minor class* terms.

The *major class* terms have been permuted so that the accession numbers of the indexed abstracts and citations will be found by the User under each of the principal component words of the *major class* term, no matter which component word he looks up first in the alphabetical index. For example, the accession numbers of abstracts and citations concerning

BENIGN GASTROINTESTINAL NEOPLASMS

will also be found under

GASTROINTESTINAL NEOPLASMS, BENIGN

and under

NEOPLASMS, BENIGN GASTROINTESTINAL.

In several cases, more than one term is used in the literature to express a single concept. To ensure consistency of indexing and facilitate complete retrieval, it was necessary to select one of these synonyms for indexing purposes. The SEE references have been inserted to guide the User to the preferred term.

The SEE ALSO references are designed to call the User's attention to related terms.

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03605 03635 03683 03702 04114 04119 04120

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03874 03877 03882
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03656 03943
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03598 03627 03723 03891 03912 03956
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03484 03618* 03693 03710
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03923*
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03938 03944 03945 03946 03947 03949 04084*
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04122
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03636 03646 03725 03730* 03735* 03747 03752 03785
03786
ENDOSCOPY,GASTROINTESTINAL
03636 03651 03652 03744
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03645 03658 04018 04048
ENDOSCOPY,LIVER
04162
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03647 03699 04007 04014 04031
ENDOSCOPY,STOMACH
03499 03626 03640 03644 03673 03678 03717 03721
03725 03799* 03812 03932 04230
ENTERITIS
SEE ENTEROCOLITIS
SEE GASTROENTERITIS
ENTERITIS DIAGNOSIS,REGIONAL
03951* 03952*
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03871 03951* 03952* 03953* 03954* 03955 03956 03958
03990 04044* 04047 04208*
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04023 04031
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03539* 03540* 03541* 03542* 03544* 03545* 03547* 03548*
03549* 03550* 03551* 03555* 03563 03565 03567 03572
03581 03582 03586 03587 03588 03592 03621 03650
03868* 04091* 04148
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03615* 03633 03649 03650 03668 03690 03714 04137*
04159
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03486* 03531 03599* 03615* 03672 04072 04074 04075

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04075
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03445* 03492 03672 03705
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ESCHERICHIA COLI
03592 03711 03903
ESOPHAGITIS
03746 03754 03764 04046
ESOPHAGUS
SEE ACHALASIA
SEE HERNIA
SEE HIATUS HERNIA
ESOPHAGUS ANOMALIES
03751 03752 03769 03786 03787 03788 03789
ESOPHAGUS ATRESIA
03774
ESOPHAGUS BIOPSY
03728 03745 04046
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03472 03733* 03741 03746 03753 03762 03763 03764
03767 03770 03778 03783 03790 03791 03819 04054
04239
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03640 03646 03655 03673 03685 03686 03709 03717
03721 03726 03727 03728 03730* 03732* 03739* 03742
03743 03744 03745 03746 03747 03749 03752 03761
03765 03766 03769 03771 03772 03774 03777 03779
03780 03785 03786 03842 04046 04234
ESOPHAGUS DISEASES
03646 03646 03745 03749 03764 03771 03780 04046
ESOPHAGUS DIVERTICULA
03646 03750 03764 03771 03791
ESOPHAGUS DYSPHAGIA
03742 03749 03754 03777 03778 03788 04046
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03636 03646 03725 03730* 03735* 03747 03752 03785
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03685 03686 03774 03778 03782 03790 03791 03827
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03827
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ESOPHAGUS NEOPLASMS,BENIGN
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03772 03773 03775 03779
ESOPHAGUS PATHOLOGY
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03744 03776 03779 03780
ESOPHAGUS RADIOLOGY
03500 03640 03646 03655 03685 03686 03709 03724
03726 03727 03730* 03732* 03742 03743 03745 03746
03747 03749 03752 03754 03761 03765 03766 03769
03771 03772 03774 03777 03780 04046 04234
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03727 03737* 03755 03941
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03731* 03737* 03742 03746 03751 03754 03785 03786
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03655 03729* 03730* 03731* 03736* 03739* 03750 03751
03752 03754 03755 03756 03757 03759 03762 03763
03767 03770 03771 03776 03777 03778 03779 03780
03782 03783 03784 03790 03791 03792 03892
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04056 04100 04111
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SEE DIGESTION
SEE LIPID ABSORPTION
SEE LIPIDS
SEE LIVER LIPID METABOLISM
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04095*
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03834 04175* 04217
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03631
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03712 04177* 04181 04183 04187

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04095*
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   03887 03889
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  SEE ALSO MALABSORPTION
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   03834 03848 03850 03853 03858 03924* 03929 03933
   03948 03949 04062 04211
GASTRECTOMY COMPLICATION TREATMENT
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GASTRECTOMY COMPLICATIONS
   03495 03809 03810 03828 03844 03849 03851 03855
   04065*
GASTRECTOMY TECHNIQUES
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   03797* 03844 03924* 04199*
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GASTRECTOMY-INDUCED METABOLIC CHANGES
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   03444* 03504* 03511* 03522 03616* 03940 04229
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   03464* 03503* 03794* 03813 03816 03836 03997 04230
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   03935 03939 03918*
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   04245
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   03596*
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   03610* 03675 03798* 03975* 03977* 04195* 04215
GASTROINTESTINAL COMPLICATIONS
   03717 03872 03937 04196* 04230 04236
GASTROINTESTINAL DIAGNOSIS
   03484 03615* 03630 03639 03642 03651 03656 03657
   03659 03675 03676 03680 03694 03702 03717 03727
   03744 03761 03779 03812 03825 03872 03886 03898
   03930 03956 03957 03999 04055 04198* 04225 04230
   04234 04235 04236 04252
GASTROINTESTINAL DISEASES
   03657 03963 04200*
GASTROINTESTINAL ENDOSCOPY
   03636 03651 03652 03744
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03500 03614* 03626 03640 03641 03652 03653 03656
03661 03680 03681 03724 03726 03811 03816 03818
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NATIONAL INSTITUTE OF ARTHRITIS AND METABOLIC DISEASES

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LANGUAGE ABBREVIATIONS

Afr.	Afrikaans
Ar.	Arabic
Bul.	Bulgarian
Ch.	Chinese
Cz.	Czech
Dan.	Danish
Dut.	Dutch
E.	English
Eston	Estonian
Fin.	Finnish
Fl.	Flemish
Fr.	French
Ger.	German
Gr.	Greek
Heb.	Hebrew
Hun.	Hungarian
Ic.	Icelandic
In.	Indonesian
It.	Italian
Jap.	Japanese
Kor.	Korean
Latv.	Latvian
Lith.	Lithuanian
Nor.	Norwegian
Pol.	Polish
Por.	Portuguese
Rum.	Rumanian
Rus.	Russian
Ser.	Serbo-Croatian
Sl.	Slovak
Sp.	Spanish
Sw.	Swedish
Th.	Thai
Turk	Turkish
Uk.	Ukrainian
Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone
ADP	adenosine diphosphate
AMP	adenosine monophosphate
ATP	adenosine triphosphate
BSP	sulfobromophthalein
C	degrees centigrade
cm	centimeter(s)
CNS	central nervous system
cpm	counts per minute
DNA	deoxyribonucleic acid
e.g.	for example
g	gram(s)
μg	microgram(s)
hr	hour(s)
i.m.	intramuscular
i.p.	intraperitoneal
IU	international unit(s)
i.v.	intravenous
kg	kilogram(s)
LD50	median lethal dose(s)
LDH	lactic acid dehydrogenase
m	meter(s)
M	molar
mEq	milliequivalent(s)
mM	millimolar
μM	micromolar
mC, μC	milli-, microcurie(s)
mg	milligram(s)
min	minute(s)
ml	milliliter(s)
mm	millimeter(s)
MTD	maximum tolerated dose
ng	nanogram (10-9)
pg	picogram (10-12)
p.o.	orally
ppm	parts per million
r	Roentgen
RBC	red blood cells (erythrocytes), red blood count
resp	respectively
Rev.	review (only in citations)
RNA	ribonucleic acid
s.c.	subcutaneous
sec	second(s)
SGOT	serum glutamic-oxalacetic transaminase
SGPT	serum glutamic-pyruvic transaminase
U	unit(s)
UV	ultraviolet
WBC	white blood cells (leukocytes), white blood count
yr	year(s)

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PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

4265 Mg^{2+}-INDUCED SHRINKAGE IN MITOCHONDRIA ISOLATED FROM YOSHIDA ASCITES HEPATOMA. *(E.)* Feo, F. (Inst. Gen. Pathol., U. Turin, Italy). *Life Sci* 8(12):663-670, 1969.

Mg^{2+} ions induced water extrusion (shrinkage) paralleled by the bivalent cation uptake in metabolizing mitochondria, in this study using mitochondria from rat liver and from AH-130 Yoshida ascites hepatoma. In the absence of metabolism relatively large amounts of Mg^{2+} were taken up, independent of the existence of a swollen state. In swollen mitochondria the bivalent cation induced shrinkage. After long-term incubation mitochondria isolated from tumor cells took up, in the absence of metabolism, about 50% of the Mg^{2+} taken up in the uninhibited state, independent of the presence of digitonin. Of this uptake 47.5% was released by washing. In the presence of an excess of EDTA small quantities of Mg^{2+} were still found in washed mitochondria.

4266 ULTRASTRUCTURE OF BRUNNER'S GLAND CELLS OF THE DOG. AN ELECTRON MICROSCOPIC STUDY OF THE CELLULAR FORMS AND ORGANIZATION IN REFED, CHOLINERGICALLY STIMULATED AND FASTED ANIMALS. *(E.)* Vaissalo, V. T. (Lab. Electron Microscopy, U. Turku, Finland). *Scand J Gastroent* 4(Suppl. 2): 1-90, 1969.

The ultrastructure of the duodenal or Brunner's gland cells was studied in 10 adult male dogs after feeding, after cholinergic stimulation by cholinesterase inhibitor substance, physostigmine, and after 4 days' starvation. In the canine Brunner's glands there are 3 main forms of cells: a dense cell with a round nucleus, a dense cell with a lobulated nucleus, (both of these are nonsecretory), and a light secretory cell. Morphological transition forms exist between these cell types. The dense cells total 5% of the cells observed. The dense form with a round nucleus has disintergrating structural features indicating an exhaustive functional state while the dense form with a lobulated nucleus has integrating structural features indicating a restitutive functional state. These cell types together with transitional forms make up the resting phase in cellular life. The light cells were found to represent an active functional phase in cellular life when the glandular cell secretes continuously according to a mill principle without alternate filling and emptying. The cumulative effect of the organism's own acetylcholine on Brunner's gland cells, produced by the application of a cholinesterase inhibitor, physostigmine, was often seen as enormously widened cisterns of rough-surfaced endoplasmic reticulum in the light secretory cells without any immediate structural effect on the secretion-forming mechanism in the Golgi area. Stimulation of this kind had no effect on the ultrastructure or number of the dense, resting cells. Four days' starvation had an effect on the light secretory cells similar to that seen in the cholinergically stimulated animals, although much less profound, i.e., there was an enlargement of the cisternae of the rough-surfaced endoplasmic reticulum of a minor degree suggesting a stimulation by the vagus; and in the Golgi area the structural parts were few suggesting diminished secretory function. No alteration was seen in the ultrastructure or number of the dense resting cells. The structural part of the organelles showed morphological variations that can be connected with the chief events of cellular function, (i.e., ingestion of raw materials, synthesis and extrusion of secretory products) as well as to integrated cellular function. The 3 functional states of canine Brunner's glands which have been described apparently constitute a recurring cycle, a biorhythm in cellular life classifiable in terms of ultrastructural morphology.

4267 EXPERIMENTAL AUTOIMMUNE GASTRITIS IN THE RHESUS MONKEY. *(E.)* Andrada, J. A. (Sch. Med., State U., New York, Buffalo), N. R. Rose and E. C. Andrada. *Clin Exp Immunol* 4(3):293-310, 1969.

Three rhesus monkeys were injected with pooled monkey gastric mucosa suspension plus complete Freund adjuvant. All 3 animals developed organ-specific autoantibodies and delayed skin tests to gastric antigen. Circulating antibodies were demonstrated by tanned-cell hemagglutination using well-centrifuged, heated gastric suspension. In immunofluorescent tests, the antibodies localized primarily in the parietal cell cytoplasm. All 3 monkeys showed histological evidence of multifocal gastritis consisting of monocyte infiltration of the mucosa and atrophy of neighboring glands. All other organs were normal. Control monkeys injected with monkey thyroid, adrenal, or testis extract did not show gastric changes.

4268 SOME OBSERVATIONS ON THE HISTOLOGIC AND SUBSTRUCTURAL ALTERATIONS IN HEPATIC CELLS IN RATS FASTED FOR 24 HOURS. *(It.)* Zanghi, M. (Inst. Gen. Clin. Surg., U. Catania, Italy), F. Finocchio, P. Cultrera and P. Vassallo. *Chir Pat Sper* 16(1): 60-70, 1968.

In young Long Evans rats, fasted for 24 hr, fragments of the right lobe of the liver were removed by laparotomy during narcosis. Histologic and histoenzymatic examination showed signs of fatty infiltration in the hepatocytes and a decrease of the PAS-positive material (glycogen). Electron microscopy showed dehydration, a more compact aspect and opacity. Dehydration appeared mainly in the cytoplasm, rather than in the nuclei. A remarkable number of mitochondria with normal structures were seen in the dehydrated hepatic cells.

4269 IRRADIATED HETEROTOPIC SEGMENTAL CANINE PANCREATIC ALLOGRAFTS. *(E.)* Merkel, F. K. (U. Minnesota Hosp., Minneapolis), W. D. Kelly, F. C. Goetz and J. Maney. *Surgery* 63(2):291-297, 1968.

Adult mongrel dogs (35-40 pounds) were used as donor and recipient. The donor received 500 r to the pancreas 3-7 days before transplantation. The recipient underwent total pancreatectomy 5-10 days before transplantation, received insulin daily as indicated by urine glucose tests and was fed pancreatin capsules to replace exocrine function. The immunosuppressive agent was antilymphocyte serum prepared in the horse against dog lymph node cells and was given daily s.c. for 1 week before and 1 week after transplantation. All animals received penicillin and chloromycetin for 5 days after each operation. Plasma and whole blood were given as necessary. Segmental heterotopic pancreatic homotransplants were performed in 15 previously pancreatectomized dogs. Heterologous antilymphocyte serum proved to be an effective immunosuppressive agent when used alone. It did not grossly impair wound healing; however, four dogs died from reactions to it. All transplants functioned initially; glucose tolerance and insulin-stimulating tests showed evidence of good function for 7 to 42 days. Survival time ranged from 5 to 55 days (average 15.6 days). The transplant was functioning normally at the time of death in 8 dogs (53%), and was either rejected or showed signs of being rejected at the time of death or sacrifice in 7 (47%). There was no instance of thrombosis of the vessels.

4270 A FLUORESCENCE MICROSCOPIC STUDY OF BILE DUCT PROLIFERATION INDUCED IN GUINEA PIGS BY α-NAPHTHYL ISOTHIOCYANATE.

(E.) Bhathal, P. S. (Pathol. Dept., U. Melbourne, Australia) and G. S. Christie. *Lab Invest* 20(5):480-487, 1969.

Three stages in the development of the lesion were recognized on using intravital fluorescence microscopy combined with histologic methods to study the increase of bile ductules in livers of 60 guinea pigs fed a diet containing 0.2% α-naphthyl isothiocyanate (ANIT). Stage 1 consisted of branching of the interlobular bile ducts and the establishment of numerous new connections with the limiting plate. Stage 2 consisted of ectasia of the canalicular lumina. Tubularization of the laminae was accompanied by grade 1 modulation (metaplasia) of the hepatocytes, characterized by polarization of the organelles. A further degree of modulation (grade 2) was found some distance peripheral to the ectasia, and this change, like the others, moved centrally. Grade 3 modulation consisted of complete alteration of the epithelium to the biliary type and was accompanied by the development of a connective tissue investment of the tubules. Stage 3 of the lesion was a phase of stabilization. At all stages the lumina of the resulting tubular structures and ductules were patent and were in continuity with the canalicular and interlobular duct systems. The increase of bile ductules induced by ANIT in guinea pigs occurs mainly by tubularization of hepatic laminae and modulation of hepatocytes, and that mitotic activity of biliary epithelium plays only a small initial role.

4271 HEPATOCELLULAR ADAPTATION AND INJURY: STRUCTURAL AND BIOCHEMICAL CHANGES FOLLOWING DIELDRIN AND METHYL BUTTER YELLOW.

(E.) Hutterer, F. (Mount Sinai Sch. Med., City U. New York, N. Y.), F. M. Klion, A. Wengraf, F. Schaffner and H. Popper. *Lab Invest* 20(5):455-464, 1969.

Serial studies of the prolonged effects of daily i.p. injections of dieldrin on female Sprague-Dawley rats indicate 3 stages of response. The 1st stage, that of induction, is characterized by an increase in liver weight, in microsomal protein, smooth endoplasmic reticulum, in the activity of aniline hydroxylase and p-nitroreductase, and the concentration of P-450 hemoprotein. During the 2nd stage, a "steady state", elevated levels are maintained and tolerance to otherwise fatal doses of dieldrin prevails. In the 3rd stage, that of decompensation, the elevated levels are maintained except for the activity of the drug-handling enzymes, which decreases. The smooth endoplasmic reticulum in this last stage consisted of packed tubules. This hypoactive, hypertrophic, smooth endoplasmic reticulum is accompanied by biochemical and morphologic alterations of mitochondria. Administration of 3′-methyl-4-dimethylaminoazobenzene results in a short period of induction followed by rapid decompensation without significant "steady state". The hypoactive, hypertrophic, smooth endoplasmic reticulum, whic may develop before light microscopic alteration of the hepatocytes occurs, may reflect the border between adaptation (no adverse effect level) and toxicity, which may be useful in toxicologic consideration.

4272 INFECTIOUS CANINE HEPATITIS: A VIROLOGIC AND ULTRASTRUCTURAL STUDY.

(E.) Givan, K. F. (Dept. Pathol. & Anat., U. Toronto, Canad and A.-M. Jézéquel. *Lab Invest* 20(1):36-45, 1969.

Young dogs inoculated i.p. with a virulent strain of infectious canine hepatitis virus showed virus in blood, spleen, kidney, and urine within 24 hr. The liver did not contain it until 3 days after inoculation. Intranuclear eosinophilic inclusions were observed in hepatocytes and Kupffer cells 3 days after inoculation and were maximal in size and number on the 4th day. Eosinophilic bodies were also noted. The nuclei of hepatocytes and Kupffer cells were found to contain numerous virus particles, approximately 650 Å in diameter, sometimes associated with crystalline formations. A few virus particles were seen in the cytoplasm of hepatocytes or Kupffer cells. Some cells showing signs of necrosis were thought to be the counterpart of the "eosinophilic bodies". Except for necrotic cells, the cytoplasm of most hepatocytes did not show prominent alterations.

4273 VIRAL HEPATITIS: RELATION OF AUSTRALIA/SH ANTIGEN TO THE WILLOWBROOK MS-2 STRAIN.

(E.) Giles, J. P. (New York U. Sch. Med., N. Y.), R. W. McCollum, L. W. Berndtson Jr. and S. Krugman. *New Eng J Med* 281(3):119-122, 1969.

Serial serum specimens in 31 MS-1 (infectious hepatitis, short incubation) and 19 MS-2 (serum hepatitis long incubation) cases of viral hepatitis were examined for the presence of Australia/SH antigen. Specimens were taken before infection through 200 days after infection and were pooled. An agar-g double-diffusion technique was used. The antigen was not detected in any serum from the MS-1 series, but it appeared regularly after MS-2 infection, usually before clinical evidence of hepatitis. In approximately half the MS-2 infections the antigen was present only transiently (up to 68 days), but in the remainder, it persisted throughout the period of intensive observation and for at least 3 yr.

4274 GASTRIC ANTIGENS IN HEALTH AND DISEASE BEHAVIOR IN EARLY DEVELOPMENT, SENESCENCE, METAPLASIA AND CANCER.

(E.) De Boer, W. G. R. M. (Monash U., Melbourne, Australia), A. Forsyth and R. C. Nairn. *Brit Med J* 3(5662):93-94, 1969

Immunofluorescence studies of the behavior of gastric antigen in health and disease showed that during fetal development both gastric and intestinal antigens are present in the gastric superficial mucous epithelium. The intestinal component disappeared soon after birth; it re-emerged in senescence and in metaplasia and neoplasia, while the gastric antigen, which normally persists in adult life, was depleted in these circumstances. The loss of adult and the re-emergence of fetal antig n both metaplasia and neoplasia suggests a possible funda- nental relationship between these conditions; the phenotypic ariation may reflect cytogenetic liability, which has malignant ransformation as a final irreversible step.

275 THE BEHAVIOUR OF CERULOPLASMIN FRACTIONS IN LIVER DISEASES. *(E.)*

rip, J. A. J. (State U., Gronigen, Netherlands), G. S. Que, . Botterweg-Span and E. Mandema. *Acta Med Scand* 185(4): 79-286, 1969.

eruloplasmin fractions I (C-C) and II (C-D) were estimated n 12 patients with infectious hepatitis, in 17 patients with ver metastases, and in 37 patients with cirrhosis of the liver. n infectious hepatitis and liver metastases serum ceruloplasmin ontent was increased and the percentage of fraction I (C-C) as decreased, but no correlation between the 2 could be ound. In cirrhotics mean serum ceruloplasmin concentration as normal but the mean percentage of fraction I (C-C) was ecreased. A positive correlation between these values could e demonstrated. Very low ceruloplasmin levels were found n some patients with the most severe form of liver cirrhosis; this was the result of an impaired synthesis, probably frac- ion I (C-C) was most affected. Only fraction I (C-C) may be ynthesized by the liver.

276 LYSOLECITHIN: A FACTOR IN THE PATHOGENESIS OF ACUTE CHOLECYSTITIS? AN XPERIMENTAL STUDY ON RABBITS BASED ON CLINI- AL FINDINGS IN HUMANS. *(E.)*

Gottfries, A. (U. öteburg, Sweden). *Acta Chir Scand* 135(3):213-217, 1969.

n a series of 16 rabbits (2.0-4.5 kg) sterile and chromatogra- hically pure lysolecithin dissolved in Ringer's solution was in- ected into the occluded and emptied gallbladder. In 9 control nimals only Ringer's solution was injected. At sacrifice 48 hr ater the gallbladder wall of the lysolecithin treated animals howed microscopical changes similar to those found in a series f patients operated on for acute cholecystitis within the first days after onset. Infiltration of the wall by inflammatory ells was present in 12 cases, mucosal necrosis in 3 others. lost of the injected lysolecithin was resorbed or disintegrated n 48 hr. As in man there was a high concentration of lyso- ecithin in the bile.

277 THE INFLUENCE OF THE ANTIMETABOLITE RIBOAZAURACIL ON EXOCRINE PANCREAS UNCTION IN RATS. HISTOLOGICAL, HISTOCHEMICAL ND ELECTRON OPTICAL STUDIES. *(Ger.)*

Putzke, H.-P. Inst. Gen. & Spec. Pathol., U. Rostock, Germany). *Exp Path* (2):134-146, 1968.

One g riboazauracil/kg body weight was injected i.p. to 30 nale rats (130 g) for 3, 7, or 10 days and the animals sacri- iced 24 hr after the last injection. Histological examinations and histochemical demonstrations of acid phosphatase, alkaline phosphatase, succinate dehydrogenases, cytochrome oxidase, ipase, and amylase were performed. After 3 days of treatment with the antimetabolite, the acini were moderately enlarged and the glandular cells loaded with secretory granules. After 7 days, diminution of the acini and only a few secretory granules could be demonstrated; tryptophan was reduced. In contrast, after 10 days of treatment, when the nucleoli were localized near the nuclear membrane and the secretory granules were only slightly reduced in number, the DNA content of the cytoplasm increased. On the 7th day of treatment the most marked changes in enzyme activity were observed: succinate dehydrogenase and cytochrome oxidase decreased; acid phosphatase disappeared from the supranuclear area; alkaline phosphatase in the capillaries was insignificantly reduced; lipase was moderately reduced; but amylase was increasing in activity. These changes in enzyme activity were less evident after 10 days of treatment. Electron microscopy confirmed the histochemical findings. The dysfunction in exocrine secretion may be correlated with a temporary injury of RNA- and enzyme-protein syntheses.

4278 BIOLOGICAL EFFECTS OF GASTROINTESTINAL ANTIBODIES. I. THE PRODUCTION OF ANTIBODIES TO COMPONENTS OF ADULT AND FETAL GUINEA PIG GASTRIC AND COLONIC MUCOSA. *(E.)*

Hausamen, T.-U. (Stanford U. Med. Sch., Palo Alto, Calif.), D. A. Halcrow and K. B. Taylor. *Gastroenterology* 56(6):1053-1061, 1969.

Injections into 11 female, New Zealand, white rabbits of aqueous extracts of adult guinea pig colon, fetal stomach, and fetal colon in complete Freund's adjuvant induced the formation of antibodies against substances which are a constituent of mucus-producing cells and their secretion, which are present both in the stomach and large intestine of adult and fetal guinea pig. In contrast, 3 similar rabbits injected with aqueous extracts of adult guinea pig stomach produced hetero- and autoantibodies against parietal cell antigen, gastric intrinsic factor, and mucous substances confined to the stomach. The role of bacterial or other exogenous antigens in the production of these antibodies was excluded by comparing results obtained with fetal and adult tissues.

4279 BIOLOGICAL EFFECTS OF GASTROINTESTINAL ANTIBODIES. II. HISTOLOGICAL CHANGES IN THE STOMACH INDUCED BY INJECTION OF SPECIFIC HETEROLOGOUS ANTIBODIES. *(E.)*

Hausamen, T. U. (Stanford U. Med. Sch., Palo Alto, Calif.), D. A. Halcrow and K. B. Taylor. *Gastroenterology* 56(6): 1062-1070, 1969.

Injection of rabbit antisera against antigens from fetal and adult guinea pig gastric mucosa into male guinea pigs (500 g) resulted in an acute inflammation confined to the stomach of the injected animals. The lesion is characterized by extreme capillary dilation, hemorrhage, and neutrophilia, and is similar to an Arthus type phenomenon. Injection of rabbit antisera against antigens from adult and fetal guinea pig colonic mucosa induced only a mild capillary dilation. No histological changes were found in rabbits which have circulating autoantibodies against constituents of gastric and colonic mucosa.

4280 ENZYMES IN CELL FRACTIONS OF HUMAN LIVER BIOPSIES. LACTATE DEHYDROGENASE AND GLUTAMATE-OXALACETATE TRANSAMINASES IN CELL FRACTIONS OF LIVER BIOPSIES FROM PATIENTS WITH NORMAL, CIRRHOTIC, AND FATTY LIVER. *(E.)*

Kemp, E. (Bispebjerg Hosp., Copenhagen, Denmark), T. Lausen, O. Munck, T. S. Olsen and N. Tygstrup. *Acta Med Scand* 185(1-2):9-12, 1969.

Liver biopsies from 31 patients with histologically normal liver, from 14 patients with cirrhosis, and from 17 patients with fatty liver were homogenized and separated into mitochondrial and cytoplasmic fractions by centrifugation. LDH was determined in the cytoplasmic fraction, and GOT in both cytoplasmic and mitochondrial fractions. The activities were related to tyrosine-containing protein. All activities showed a great variation from patient to patient in all groups, but the mean values of cytoplasmic LDH and GOT were significantly depressed in cirrhotic livers, and mitochondrial GOT was significantly elevated in fatty livers.

4281 MITOCHONDRIAL ANTIBODIES IN PRIMARY BILIARY CIRRHOSIS. II. THE COMPLEMENT FIXING ANTIGEN AS A COMPONENT OF MITOCHONDRIAL INNER MEMBRANES. *(E.)* Berg, P. A. (Middlesex Hosp. Med. Sch., London, England), U. Muscatello, R. W. Horne, I. M. Roitt and D. Doniach. *Brit J Exp Path* 50(2):200-208, 1969.

The autoantibodies found in the sera of patients with primary biliary cirrhosis react with a component of the mitochondrial inner membranes separated from outer membranes of rat liver mitochondria. Electron microscopy and marker enzyme tests were used to assess the purity of the inner and outer membrane fractions obtained by 2 different methods. Outer membranes were inactive. With negative-staining it was possible to visualize antibody binding to mitochondrial membranes. With high electron microscope resolution the 90 Å particles on the cristal membranes could be seen as not involved in the reaction with antibody. The precise antigenic site upon the mitochondrial inner membranes was not established.

4282 MORPHOGENESIS OF EXPERIMENTAL TUMORS OF THE ESOPHAGUS. *(E.)* Napalkov, N. P. (Prof. N. N. Petrov Res. Inst. Oncol., Leningrad, USSR) and K. M. Pozharisk. *J Nat Cancer Inst* 42(6):927-940, 1969.

In 42 male non-inbred albino rats (100-140 g) tumors of the esophagus were induced with N-methyl-N-nitrosoaniline (14 mg/kg daily initially, 28 mg/kg after 4-5 months). After 3 months 2 rats were killed monthly for 20 months and the successive changes in the esophagus studied. The morphogenesis of experimental esophageal carcinomas begins with diffuse hyperplastic changes in the epithelium (acanthosis) which are accompanied by hyperkeratosis and parakeratosis and result in the formation of foci of leukoplakia (day 112). Hypertrophy and proliferation of the connective tissue papillae beneath the foci of leukoplakia cause development of the verrucose lesions designated leukokeratosis (6th-8th month). Subsequent polypoid outgrowths of the altered mucosa form papillomas (375 days). Some papillomas progressed to dysplasia (13-14 months) and carcinoma (459 days).

4283 ANATOMICAL BASIS FOR SURGICAL APPROACHES TO THE INTRAHEPATIC DUCTS OF THE RIGHT HEPATIC LOBE. *(Rus.)* Futoryan, Ie. S. (Moscow Munic. Clin. Hosp. No. 62, USSR) and B. M. Shubin. *Vestn Khir Grekov* 99(8):35-38, 1967.

4284 THE EFFECT OF RESERPINE UPON GASTRO-INTESTINAL SEROTONIN IN THE SPRAGUE-DAWLEY RAT. *(E.)* Thompson, J. H. (UCLA Sch. Med., Los Angeles, Calif.) and L. B. Campbell. *Experientia* 23(10): 826-828, 1967.

4285 FLUID FLOW IN THE LIVER DEMONSTRATED WITH HORSE RADISH PEROXIDASE. *(E.)* Papadimitriou, J. M. (Dept. Pathol., U. W. Australia, Perth) and M. N. I. Walters. *Amer J Anat* 123(2):475-479, 1968.

4286 COPPER AND MANGANESE CONCENTRATION IN THE LIVER AND SPLEEN OF PREMATURE INFANTS DYING DURING THE FIRST FEW DAYS AFTER BIRTH. *(Rus.)* Sultanova, G. F. (Sci. Res. Inst. Matern. Infants, Sverdlovsk, USSR). *Pediatriia* 47(9):66-67, 1968.

4287 CYTOLOGY OF INTESTINAL EPITHELIAL CELLS. *(E.)* Toner, P. G. (Dept. Anat., U. Glasgow, Scotland). *Int Rev Cytol* 24:233-343, 1968.

4288 THE GUT EPITHELIUM—A FIRST LEVEL LYMPHOID ORGAN? *(E.)* Fichtelius, K. E. (Dept. Histol., U. Uppsala, Sweden). *Exp Cell Res* 49(1): 87-104, 1968.

4289 LIGHT AND ELECTRON MICROSCOPIC STUDY OF A LEIOMYOBLASTOMA OF THE DUODENUM. [CASE REPORT] *(E.)* Gerszten, E. (Med. Coll. Virginia, Richmond) and S. Kay. *Amer J Dig Dis* 14(5): 350-355, 1969.

4290 SECONDARY AMYLOIDOSIS OF HUMAN COLONIC MUCOSA. LIGHT AND ELECTRON MICROSCOPIC FINDINGS. *(E.)* Pittman, F. E. (Tulane U. Sch. Med., New Orleans, La.), J. C. Pittman, V. J. Ferrans, J. C. Harkin and J. C. Weichert. *Amer J Dig Dis* 14(5):356-367, 1969.

4291 CYTOTOXICITY OF PHENOTHIAZINES ON CHANG LIVER CELLS AS MEASURED BY ENZYME LEAKAGE. *(E.)* Dujovne, C. A. (Johns Hopkins U. Hosp., Baltimore, Md.) and H. J. Zimmerman. *Proc Soc Exp Biol Med* 131(2):583-587, 1969.

4292 PHOSPHOLIPID COMPOSITION OF MITOCHONDRIA AND MICROSOMES OF LIVER AND KIDNEY IN ADRENALECTOMIZED, HYPOPHYSECTOMIZED, AND DIABETIC RATS. *(E.)* Johnson, J. D. (U. North Dakota Sch. Med., Grand Forks, N. D.) and W. E. Cornatzer. *Proc Soc Exp Biol Med* 131(2):474-478, 1969.

4293 EFFECTS OF HYPEROXIA AND HYPOXIA ON MITOSIS IN THE NORMAL AND REGENERATING RAT LIVER. *(E.)* Talarico, K. S. (Natl. Aeronautics Space Admin., Moffett Field, Calif.), D. D. Feller and E. D. Neville. *Proc Soc Exp Biol Med* 131(2):430-434, 1969.

4294 BINDING OF CAERULEIN BY ANTIBODIES TO HUMAN GASTRIN I. *(E.)* McGuigan, J. E.

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(Washington U. Sch. Med., St. Louis, Mo.). *Gastroenterology* 56(5):858-861, 1969.

4295 EXPERIMENTAL SHIGELLA ENTEROCOLITIS IN GUINEA-PIGS (ANALYSIS WITH FLUORESCENT ANTIBODIES). *(Rus.)* Bibinova, L. S. (Inst. Exp. Med., Acad. Med. Sci. USSR, Leningrad), T. N. Khavkin, N. S. Nikul'nikova and Z. M. Kruglikhina. *Tr Leningr Inst Epidem Microbiol Paster* 33:329-337, 1968.

4296 MORPHOLOGICAL EXAMINATION OF BIOPSIES OF THE SMALL INTESTINE. *(Rus.)* Aruin, L. I. (Acad. Med. Sci., USSR, Moscow). *Arkh Pat* 29(9):3-13, 1967.

4297 FINE STRUCTURE AND GENESIS OF CYLINDROMA (ADENOIDCYSTIC CARCINOMA) OF THE SALIVARY GLANDS. FURTHER INVESTIGATIONS ON THE ROLE OF MYOEPITHELIAL DIFFERENTIATED CELLS IN SALIVARY GLAND TUMORS. *(Ger.)* Hübner, G. (Pathol. Inst., U. Cologne, Germany), O. Kleinsasser and H. J. Klein. *Virchows Arch Path Anat* 347(4):296-315, 1969.

4298 STUDIES ON THE EARLY CANCER OF THE HEAD OF THE PANCREAS. *(Jap.)* Honda, K., R. Motoki, K. Hanzawa, M. Koseki, K. Suzuki and M. Sekine. *Jap J Cancer Clin* 13(12):1119-1122, 1967.

4299 THE ROLE OF DETOXICATION OF VICHY WATER. HISTOENZYMOLOGICAL STUDIES. *(Fr.)* Wegmann, R. (Paris, France) and M. Merle. *Rev Intern Hepat* 17(7):675-712, 1967.

4300 VARIATIONS IN THE NUMBER OF RETICULOCYTES AFTER PARTIAL EXPERIMENTAL HEPATECTOMY. *(Rum.)* Vasilescu, V. (I. M. F., Bucharest, Romania) and F. Mosora. *Fiziol Norm Pat* 13(4):353-359, 1967.

4301 SURGICAL ANATOMY OF THE PANCREATIC HEAD ARTERIES. *(Rus.)* Khomenko, N. M. (M. Gorki Zaporozhe Inst. Postgrad. Med., USSR). *Vestn Khir Grekov* 99(10):47-49, 1967.

4302 RADIOACTIVE ISOTOPES IN THE EVALUATION OF HEPATIC BLOOD FLOW. *(It.)* Caldara, G. (Ospedale di Circolo di Cantu, Italy). *Arch Sci Med (Torino)* 124(1):109-124, 1967.

4303 S.H. ANTIGEN IN HAEMODIALYSIS-ASSOCIATED HEPATITIS. *(E.)* Turner, G. C. (Regional Publ. Hlth. Lab., Liverpool, England) and G. B. B. White. *Lancet* 2(7612):121-124, 1969.

4304 LDH ISOZYME ACTIVITIES IN SUBCELLULAR FRACTIONS OF LIVER AND HEPATOMA. *(E.)* Brown, H. D. (Cancer Res. Ctr., Columbia, Mo.), S. K. Chattopadhyay, A. B. Patel, R. P. Pugh, B. Matthews and S. N. Pennington. *Missouri Med* 66(6):418-420, 1969.

4305 THE ENZYME HISTOCHEMISTRY OF GASTRIC CARCINOMA IN MAN. *(E.)* Lev, R. (New York Med. Coll., N. Y.), H. I. Siegel and G. B. J. Glass. *Cancer* 23(5):1086-1093, 1969.

4306 A NEW SYSTEM FOR TEACHING PROCTOSIGMOIDOSCOPIC MORPHOLOGY. *(E.)* Markman, H. D. (Albert Einstein Coll. Med., Yeshiva U., Bronx, N. Y.). *Amer J Gastroent* 52(1):65-69, 1969.

4307 ON A PARTICULAR EPITHELIAL LESION OF THE MESENTERIAL INTESTINE IN TWO CASES OF COMPLEX ENTEROPATHY (BACTERIAL ? DIENZYMATIC ?). *(It.)* Gasbarrini, G. (Inst. Spec. Med. Pathol., U. Bologna, Italy), F. Faggioli, G. Fontana, N. Melchionda and S. Casanova. *Arch Ital Mal Appar Dig* 35(5): 468-478, 1969.

4308 BIOCHEMICAL CHANGES IN MITOCHONDRIA OF THE LIVER TREATED WITH ALCOHOL. I. ON LIPOPEROXIDATION. *(It.)* Salvioli, G. F. (Inst. Gen. Med. Clin., U. Modena, Italy) and N. Carulli. *Arch Ital Mal Appar Dig* 35(5):445-450, 1969.

See also: 4361,4433,4594,4937,4969,4981

4309 ROLE OF LYMPHATIC SYSTEM IN WATER AND SOLUTE TRANSPORT FROM RAT INTESTINE *IN VITRO*. *(E.)* Lee, J. S. (U. Minnesota, Med. Sch., Minneapolis). *Quart J Exp Physiol* 54(3):311-321, 1969.

The results of this study confirm previous observations that water and solute are primarily transported from the intestine by the lymphatic system of rat jejunum *in vitro*, regardless of the nature of the serosal bathing medium (moist air, mineral oil or Ringer solution), or degree of intestinal motility. The transport of fluid by the venous system was negligible under all circumstances so far observed. Lymph flow decreased with the increase of mucosal fluid osmolarity but was not affected by changing serosal fluid osmolarity. Lymph was always isosmotic with the mucosal fluid whether the latter was hypo-, iso-, or hypertonic. The composition of lymph with respect to concentrations of glucose, Na, K and Cl was the same as that of the absorbed fluid. The glucose concentration in the lymph was closely related to that in the bathing fluid on the mucosal side, rather than to that on the serosal side. Apparently the formation of lymph in the intestine is closely associated with water and solute absorption.

4310 STUDY OF THE BILIARY EXCRETION OF SULFOBROMOPHTHALEIN BY CONTINUOUS ANALYSIS IN THE RAT. *(Fr.)* Cassaigne, R. (Fac. Med., Lille, France), C. Bel and J. Vanlerenberghe. *Lille Med* 13(3): 303-306, 1968.

BSP excretion was analyzed continuously in the bile of 10 male Wistar rats after injection i.v. of 4 mg/rat in 30 sec. Besides the concentration obtained with the continuous analysis using an autoanalyzer, spectrophotometric measurements were made of samples taken every 5 or 10 min. The dye appeared in the bile 4 sec after injection. The maximum concentration (759 mg/100 ml) was obtained after 10 min. At 50 min the biliary concentration was 32 mg/100 ml and 83% of the BSP injected had already been eliminated. The average values showed that the measurement of fractions underestimated the maximum concentration by 8% in samples at 5 min, and 30% in those at 10 min. Since continuous analysis is currently difficult, at least 5 min sampling should be done to reflect the actual biliary excretion of BSP.

4311 ABSORPTION OF ^{131}I-TRIOLEIN AND OF ^{131}I-OLEIC ACID IN SOME LIVER INJURIES (OBSTRUCTIVE JAUNDICE, CIRRHOSIS, STEATOSIS, AND CANCER OF THE LIVER). *(Fr.)* Afifi, A. (Inst. Natl. Santé Recherche Méd., Paris, France) and P. Boivin. *Rev Int Hepat* 17(5):411-421, 1967.

Sixty-seven patients (23 with obstructive jaundice, 29 cirrhosis, 4 steatosis, and 11 cancer of the liver) were given 50-100 μC ^{131}I-triolein or ^{131}I-oleic acid after thyroid blockade with lugol. A dietary regimen of 100 g lipids, 120 g proteins and 270 g carbohydrates was enforced for 3 days. Controls were 20 normal subjects for triolein and 10 for oleic acid tests. In obstructive jaundice both of the isotopic tests were abnormal. In cirrhosis there was moderate malabsorption of fats, but in severe hepatic steatosis fat absorption was not altered. In liver cancer there was no clearcut alteration; however, malabsorption of fats occurred sometimes.

4312 ISOTOPIC DETERMINATION OF INTESTINAL CALCIUM ABSORPTION IN NORMAL SUBJECTS. *(E.)* Matulen, C. A. (Hosp. Rawson, Buenos Aires, Argentina), M. L. Cabrejas and R. J. Soto. *Metabolism* 18(5): 395-405, 1969.

Twenty-four ambulatory subjects (average age 38; range 17 to 77 yr) were subjected to 3 assay methods simultaneously to determine the true absorption of radiocalcium from the gastrointestinal tract in normal individuals. The cumulative fecal excretion, and the double isotope ratio in plasma and urine between ^{47}Ca administered p.o. and ^{45}Ca i.v. were used. The measurement of ^{45}Ca fecal excretion was used to correct the endogenous contribution to ^{47}Ca fecal content. The results showed the 3 methods to be equally reliable in the assessment of radiocalcium absorption. However, peak plasma values of oral ^{47}Ca did not accurately reflect the true gastrointestinal absorption of the isotope. The mean true fecal excretion in terms of the % ^{47}Ca absorbed was 47.6. The % ^{47}Ca excreted in 24-30 hr urine was 49.4 and the % ^{47}Ca in 24 hr plasma was 46.6. The test should be standardized with 200 mg in the carrier and the use of calcium chloride as the carrier salt.

4313 INHIBITION OF PROTEIN SYNTHESIS AND ABSORPTION OF LIPID INTO THORACIC DUCT LYMPH OF RATS. *(E.)* Redgrave, T. G. (U. Western Australia, Nedlands, Perth). *Proc Soc Exp Biol Med* 130(3): 776-780, 1969.

Absorption of micellar lipid into thoracic duct lymph of unanesthetized male albino Wistar rats (200-220 g) was studied after i.v. administration of actinomycin D or cycloheximide. Micellar lipid was infused steadily into the upper small intestine to avoid complications by defective gastric emptying or defective lipolysis. Actinomycin D, 50 μg/rat, inhibited mucosal protein synthesis, but absorption of fat into the lymph was unimpaired after this dosage. Malabsorption produced by larger doses of actinomycin D or cycloheximide was accompanied by a marked decline in lymph flow. The change in lymph flow was closely related to decreased recoveries of lipid in the lymph, and reduced flow appeared to be more important than suppression of mucosal protein synthesis. Chylomicron formation is not dependent on normal mucosal protein synthesis.

4314 ARBUTIN ABSORPTION IN HUMAN SMALL INTESTINE: A SIMPLE PROCEDURE FOR THE DETERMINATION OF ACTIVE SUGAR UPTAKE IN PERORAL BIOPSY SPECIMENS. *(E.)* Semenza, G. (Pathol. Inst., U. Zurich, Switzerland), J. Bircher, E. Mülhaupt, T. Koide, E. Pfenninger, T. Marthaler, U. Gmünder and U. P. Haemmerli. *Clin Chim Acta* 25(2):213-219, 1969.

A procedure for the determination of arbutin (the β-glucoside of hydroquinone) uptake in human small intestinal biopsy specimens is described in detail. The specimens were obtained with a modified Crosby capsule 15 cm distal to the ligament of Treitz from 18 normal patients and 3 patients with nontropical sprue. Arbutin uptake for the entire group of clinically normal patients averaged 16.8 μmoles ± 7.7 standard deviation (S.D.), 19.6 ± 8.2 S.D. for morphologically normal patients (12), 7.10 for those with jejunitis in their biopsies and 6.49, 5.64 and 6.4 μmoles in those with nontropical sprue. Uptake in the last patient rose to 12.40 after 1½ yr of a gluten-free diet. The data are corrected for extracellular space influence.

4315 AUTORADIOGRAPHY OF INTESTINAL ABSORPTION OF SULPHUR-LABELED METHIONINE IN SENESCENCE. *(E.)* Penzés, L. (U. Med., Budapest, Hungary), G. Simon and M. Winter. *Exp Geront* 3(4):321-325, 1968.

The intestinal absorption of ^{35}S-labeled methionine in young (7 weeks old, 100-120 g) and old (2½ yr old, 220-240 g) Wistar rats was evaluated using autoradiography. The rats were anesthetized, the intestinal tract exposed, a jejunal loop made, and 10 μC ^{35}S-methionine/100 g body weight introduced into the loop. The intestinal loops were replaced, and removed after 1, 4, 10, or 20 min and their contents washed. Autoradiograms showed the distribution of radioactivity in the jejunal tissue in a young rat 1 min postoperatively to be mainly in the middle part of the villi as well as in the submucosa while in the old rat more intense radioactive images were seen in the submucosal layers and in the upper part of the villi. Four min after operation the tracer substance was moving toward the base of the villi and the crypts of Lieberkühn in both young and old rats. The submucosa of the old animals contained about twice as much radioactivity as that of the young. Ten min postoperatively there was a definite localization of radioactivity in the villi and submucosa. The patterns of the villi in the jejunum of the aged rats were nearer to the submucosa than those of the young. Twenty min after operation there was a great diminution of radioactivity: old tissue showed some radioactive patterns in the submucosa and the villi, but young tissue almost none. The results indicate that a considerable uptake and incorporation of ^{35}S-labeled methionine from the aged rat gut occurs. The quantitative differences in intestinal uptake as aging advances were observed previously, and are not directly related to the changes disclosed by autoradiography.

4316 PRODUCTION AND EXCRETION OF HYDROGEN GAS IN MAN. *(E.)* Levitt, M. D. (Boston U. Sch. Med., Mass.). *New Eng J Med* 281(3):122-127, 1969.

Intestinal infusions of gas were used to study H_2 production in the human intestine. The volume of H_2 in the bowel of 10 normal subjects varied from 0.06 to 29 ml H_2 production, which averaged 0.24 ml/min in the fasting state, sharply increased after intestinal instillation of lactose, to a mean peak rate of 1.6 ml/min. Ingestion of food also increased H_2 production by 7- to 30-fold. In the normal intestine, more than 99% of H_2 production was colonic, but small-bowel production was increased in a patient with excessive numbers of small-bowel bacteria. H_2 production in man is primarily dependent upon the delivery of ingested, fermentable substrates to an abundant intestinal flora normally present only in the colon. A mean of 14% of the total H_2 production was excreted by the lungs, and rates of breath H_2 excretion and H_2 production correlated well ($r = 0.94$). Respiratory H_2 excretion can be used therefore as an indicator of intestinal H_2 production.

4317 INTESTINAL SUGAR TRANSPORT: IONIC ACTIVATION AND CHEMICAL SPECIFICITY. *(E.)* Bihler, I. (U. Manitoba Fac. Med., Winnipeg, Canada). *Biochim Biophys Acta* 183(1):169-181, 1969.

In this *in vitro* study of the mode of absorption of several monosaccharides, using segments and everted sacs of hamster small intestine, the data suggest a dual specificity of a joint sugar carrier. In the absence of Na+ its affinity for many diverse sugars is low and the presence of Na+ increases the affinity for only some of these sugars. The potential for active transport depends on the extent of this activation by Na+ and varies with different sugars from negligible to very great. It is indicated that the slowly penetrating sugars which are not actively transported interact with the active transport system.

4318 CLEARANCE BY HETEROLOGOUS LIVER PERFUSION IN SEVERE UREMIC CHOLANGITIS. *(Fr.)* Bert, J. M. (St. Eloi Hosp., Montpellier, France), C. Romieu, H. Pujol, C. Solassol, Y. Gestin, J. Garrigues and J. L. Balmes. *Rev Medicochir Mal Foie* 43(4):153-164, 1968.

Hepatic clearance was carried out in 6 patients in hepatic coma using a heterologous liver (pig) connected by the femoral artery and vein. A clearance of 4 hr was performed in 1 patient intoxicated by Amanita phalloides, and he survived for 36 hr; 1 patient with ethylic cirrhosis survived 24 hr after a 5 hr clearance; 1 patient primitive biliary tract cirrhosis survived 3 days after clearance for 2½ hr; 1 patient with ethylic cirrhosis survived 6 hr after clearance for 2 hr; 1 patient with secondary biliary tract cirrhosis is still living after clearance for 3 hr; 1 6-yr-old patient with viral hepatitis after clearance for 2 hr, and 2 days later, a second clearance for 2½ hr, is still living. No death was directly caused by the attempt of clearance.

4319 BONE DISEASE AND CALCIUM ABSORPTION IN PRIMARY BILIARY CIRRHOSIS WITH SPECIAL REFERENCE TO VITAMIN-D THERAPY. *(E.)* Kehayoglou, A. K. (Royal Free Hosp., London, England), C. D. Holsworth, J. E. Agnew, M. J. Whelton and S. Sherlock. *Lancet* 1(7545):715-719, 1968.

Calcium absorption and bone disease were studied in 12 patients with primary biliary cirrhosis before and after treatment with i.m. vitamin D. The patients were 39-68 yr of age and had their disease from 9 months to 4 yr. Diagnosis was by clinical criteria and histology: pruritus was constant and had preceded the jaundice in 7 of 12 patients; serum bilirubin was elevated; no patient was in coma, precoma or had ascites; 5 patients had xanthomas; 1 complained of bone pain and tenderness; and 8 had lost weight. Calcium absorption was subnormal in 4 before treatment. Vitamin D was given i.m. in a dose of 100,000 IU weekly for 4 weeks and then 100,000 IU monthly. Absorption of aqueous ^{47}Ca as calcium chloride was normal when measured either after 1-3 months or 12 months of vitamin D treatment. Crush fractures of vertabrae were present in 4 patients, but none of 12 had radiological signs of osteomalacia. However, bone biopsy specimens showed osteomalacia in 1 patient. Since 7 patients excreted abnormally low quantities of infused calcium, they may have had early osteomalacia. In 5 patients tested after 1-3 months of vitamin D treatment, calcium infusion tests remained abnormal. After 12 months of treatment, however, the tests were normal. Subsequent bone fractures occurred in 3 patients. Vitamin D may repair the defective absorption of a soluble calcium salt and thereby prevent osteomalacia, but it does not halt the progress of bone disease in patients with primary biliary cirrhosis.

4320 ESTIMATION OF INTESTINAL ABSORPTION OF PROTEIN WITH ^{75}Se SELENOMETHIONINE IN NORMAL SUBJECTS. *(It.)* Cristina, P. (United Munic. Hosp., Venice, Italy), G. Bruscagnin and C. Fabris. *Clin (Bologna)* 28(3):204-211, 1968.

The intestinal absorption of ^{75}Se-selenomethionine was studied in 18 normal subjects (8 males and 10 females, aged 27-76 yr). After the p.o. administration of 50 µC of ^{75}Se-selenomethionine samples of blood were taken 30 min, and 1, 2, 3, 4, 5, and 6 hr and the radioactivity measured. The percentage of the dose recovered was calculated and the results given for each subject. A curve showing the percent of the dose/liter of plasma plotted against time reveals: a rapid increase from 1.58% at 30 min to 9.54% at 3 hr, a plateau with values of 10.64% at 4 hr and 10.72% at 5 hr; and a slight decline at 6 hr to 9.16%. Eleven normal subjects (3 men and 8 women, aged 49-76 yr) were given 200 µC of ^{75}Se-selenomethionine i.v. for scintillation scanning of the pancreas. Measurements were recorded 1, 2, 5, 10, 20, 40, 60 min and 2, 3, 4, 6, and 8 hr after injection. From initial values of 8.02% and 5.91% at 1 and 2 min, resp., there was a drop at 20 min to 1.74% followed by a gradual increase to a plateau with values of 4.86% at 3 hr, 4.94% at 4 hr, 5.07% at 6 and 5.40% at 8 hr. The agent, ^{75}Se-selenomethionine, may prove to be a useful tool in the study of protein absorption from the gastrointestinal tract.

4321 STUDY OF THE OVERLOADING OF NH_4 IONS DURING ISOLATED LIVER PERFUSION IN THE PIG. *(Fr.)* Gravagne, G. (Fac. Med., Montpellier, France), G. Solassol, H. Michel and C. Sany. *C R Soc Biol* 162(1):188-191, 1968.

The metabolism of NH_4^+ ion and formation of urea were studied during pig liver perfusion in *in vitro* experiments. With discontinuous overloading a dose of 0.20 g NH_4Cl was metabolized in 15-20 min; during a perfusion of 8 hr, the liver metabolized a total of 2.5/3 g NH_4Cl given in 18 divided doses. Blood urea increased from 0.30 to 0.70 g/liter. Suprahepatic hyperammonemia was always less than the hyperammonemia of the portal vein. With a portal ammonemia of 500 µg/100, ammonia was completely metabolized by a simple passage through the liver, while suprahepatic ammonemia remained at its base value. Continuous overloadings were made by the perfusion of a solution of 8 g/liter NH_4Cl at 0.75 ml/min. During 4½ hr portal ammonemia remained at 500 µg/100 ml and the suprahepatic did not increase; blood urea increased from 0.30 to 0.80 g/liter. After 4½ hr, suprahepatic ammonemia increased to the level of the portal ammonemia. At the end of the experiment values returned to normal. This method which preserves main liver functions for at least 6 hr, could be used for extra-corporeal hepatic assistance in man, or for conservation of liver for transplants.

4322 FECAL AND URINARY EXCRETION OF ^{131}I-ROSE BENGAL DURING OBSTRUCTIVE JAUNDICE IN INFANTS AND THE NEWBORN. *(Fr.)* Desbuquois, B. (Hôpital Parrot, Paris, France), P. Tron and D. Alagille. *Arch Franc Pediat* 25(4):379-391, 1968.

Fecal and urinary excretion of ^{131}I-Rose Bengal during a 72-hr period was studied in 45 infants: 14 (1-6 months old) without any symptoms referable to the respiratory or digestive tracts as controls; 23, (1-20 months old) with atresia of the extrahepatic biliary tract; and 8, (1-20 months old) with intrahepatic cholestasia with permeable extrahepatic biliary tracts. For the controls, the excretion of ^{131}I in feces was 44-81% of the amount injected in 72 hr; in patients with biliary atresia it was 0.1-17%, and in those with obstructive jaundice it was 4-43%. The urinary excretion of ^{131}I for the 3 groups was: 2-19, 12.2-61.8, and 7-46.8%, resp. The feces/urine ^{131}I excretion ratio was 3.6 in the controls, 0-0.83 in biliary atresia, and 0.29-3.63 in obstructive jaundice. The method may be useful in differential diagnosis of obstructive jaundice.

4323 EFFECTS OF GROWTH HORMONE ADMINISTRATION ON HEPATIC EXCRETION OF BROMSULFALEIN. *(E.)* Morris, T. Q. (Roosevelt Hosp., New York, N. Y.), R. Preisig, J. C. Shaver and N. P. Christy. *Proc Soc Exp Biol Med* 130(4):1183-1188, 1969.

Chronic administration of bovine growth hormone (0.25 mg/kg, s.c. 3 times/week for 6 weeks and then 0.5 mg/kg 5 times/week) was studied in 3 pure-bred, 8-month-old beagle dogs in order to define the effects of this hormone on the hepatic handling of BSP. Weight gain in the 3 treated dogs averaged 11.7 pounds during the first 9 months as compared to 4 pounds in 3 untreated dogs (controls). The 2 male dogs gained 13 and 16 pounds while the female gained 5. During the initial 3 months of administration the biliary transport maximum of BSP increased 58%. There was no change in the storage capacity for BSP. Thereafter, a decrease in the biliary transport maximum to near original levels was observed. Administration of growth hormone from another species (ovine) again produced a rise in the biliary transport maximum in at least 1 of the same animals. Evidence suggests that growth hormone exerts a regulatory influence on hepatic excretory function.

4324 CYCLOHEXIMIDE EFFECT ON VITAMIN B_{12} ABSORPTION AND INTRINSIC FACTOR PRODUCTION IN THE RAT. *(E.)* Yeh, S. D. J. (Div. Med. Res., Sloan-Kettering Inst., New York, N. Y.) and M. E. Shils. *Proc Soc Exp Biol Med* 130(4):1260-1264, 1969.

The effect of cycloheximide on vitamin B_{12} absorption and on intrinsic factor production were studied in isolated rat intestinal loops. Cycloheximide (0.5 mg/kg) inhibited ^{14}C-leucine-1 incorporation into the proteins of various tissues including stomach and small intestine. When vitamin B_{12} was given intragastrically, rats given cycloheximide showed a significant delay in the passage of the vitamin from the stomach. When the dose of cycloheximide was increased five-fold, 34.6% ± 4.7% of the vitamin radioactivity was present in the stomach 6 hr later (8 hr after cycloheximide) as compared with 0.03 ± 0.01% in the controls. Cycloheximide also decreased the absorption of ^{57}Co, presumably as intact vitamin B_{12}, by decreasing the amount of intrinsic factor secreted in a given time and by interfering with absorption in the small intestine. The cause of the delayed gastric emptying with cycloheximide and its inhibitory action on vitamin absorption in the small intestine are unknown.

4325 A STUDY OF THE INTESTINAL ABSORPTION AND TURNOVER OF RADIOMETHIONINE DURING PREGNANCY AND LACTATION. *(Hun.)* Penzes, L. (State Inst. Publ. Hlth., Budapest, Hungary) and G. Simon. *Kiserl Orvostud* 20(1):41-47, 1968.

4326 DETERMINING THE PERMEABILITY OF THE GLANDULAR CELLS OF THE STOMACH IN MIDDLE-AGED AND ELDERLY PATIENTS. *(Rus.)* Smolianskii, B. L. (Leningrad Inst. Sanit. Hyg. Med., USSR) and T. D. Gordeieva. *Lab Delo* (2):73-74, 1968.

4327 THE EFFECT OF DIADYNAMIC CURRENTS ON ABSORPTION OF LIPIDS AND FATTY ACIDS IN THE INTESTINE. *(Uk.)* Faitel'berg-Blank, V. R. (Tselinograd Med. Inst., USSR) and S. G. Matveieva. *Fiziol Zh (Kiev)* 14(1):88-93, 1968.

4328 INTESTINAL ENZYMES IN LIPID DIGESTION. *(Fr.)* Guy-Grand, B. (Dept. Human Nutrit., Hotel Dieu, Paris, France) and H. Bour. *Sem Hop* 44(60):2678-2685, 1968.

4329 INTERACTION IN DRUG ABSORPTION FROM THE GASTROINTESTINAL TRACT. *(Sw.)* Andersson, S. (Karolinska Hosp., Stockholm, Sweden). *Läkartidningen* 65(Suppl. 1):30-33, 1968.

4330 CALCIUM ABSORPTION AND ITS DISTURBANCES. *(Pol.)* Jankowska, E. (L. Pasteur Hosp. Lodz, Poland). *Wiad Lek* 20(18):1685-1687, 1967.

4331 ABSORPTION AND EXCRETION OF DRUGS. XXXII. ABSORPTION OF BARBITURIC ACID DERIVATIVES FROM RAT SMALL INTESTINE. *(E.)* Kakemi, K. (Kyoto U., Japan), T. Arita, R. Hori and R. Konishi. *Chem Pharm Bull (Tokyo)* 15(12):1883-1887, 1967.

4332 METABOLISM OF TEREPHTHALIC ACID. III. ABSORPTION OF TEREPHTHALIC ACID FROM THE GASTROINTESTINAL TRACT AND DETECTION OF ITS METABOLITES. *(E.)* Hoshi, A. (Natl. Cancer Ctr. Res. Inst., Tokyo, Japan) and K. Kuretani. *Chem Pharm Bull (Tokyo)* 15(12):1979-1984, 1967.

4333 NON-DIALYZABLE MANGANESE, COPPER AND SODIUM IN HUMAN BILE. *(E.)* Miller, E. B. (VA Hosp., Hines, Ill.), E. L. Kanabrocki, L. F. Case, L. S. Graham, T. Fields, Y. T. Oester and E. Kaplin. *J Nucl Med* 8(12):891-895, 1967.

4334 INTESTINAL ABSORPTION OF SIX TRITIUM-LABELED DIGITALIS GLYCOSIDES IN RATS AND GUINEA PIGS. *(E.)* Greenberger, N. J. (Ohio State U. Coll. Med., Columbus), R. P. MacDermott, J. F. Martin and S. Dutta. *J Pharmacol Exp Ther* 167(2):265-273, 1969.

4335 THE EFFECT OF ETHACRYNIC ACID ON SODIUM TRANSPORT BY ISOLATED RABBIT ILEUM. *(E.)* Chez, R. A. (U. Pittsburgh Sch. Med., Pa.), E. O. Horger III and S. G. Schultz. *J Pharmacol Exp Ther* 168(1):1-5, 1969.

See also: 4490,4559,4595,4755,4761

MOTILITY

4336 UNCLASSIFIED OESOPHAGEAL MOTOR DISORDERS SIMULATING ACHALASIA. *(E.)* Hogan, W. J. (Marquette Sch. Med., Milwaukee, Wis.), C. R. Caflisch and D. H. Winship. *Gut* 10(3):234-240, 1969.

Dysphagia, esophageal dilatation, and profound esophageal motor dysfunction led to the clinical diagnosis of achalasia in 6 patients. Although the diagnosis could not be substantiated, appropriate studies excluded other esophageal diseases, e.g., organic stricture, collagen disease, generalized neuromuscular disorders, diffuse spasm, and presbyesophagus. Esophageal motility studies showed primary peristalsis and/or inferior sphincter relaxation following deglutition in all patients. While these phenomena were not persistently absent (achalasia), the frequency of their occurrence was much less than normal. Intraluminal balloon distention evoked secondary peristalsis in 2 patients and sphincteric relaxation in 5. A positive Mecholyl test was elicited in 3. One patient, with a negative Mecholyl test, had no demonstrable ganglion cells on full-thickness distal esophageal biopsy. It is possible that some or all represent incomplete forms of true achalasia.

4337 INTESTINAL MOTILITY IN THE GUINEA PIG, IN DIFFERENT STRAINS OF ANIMALS AND IN DIFFERENT ALIMENTARY CONDITIONS. *(It.)* Tirone, P. (Div. Res. Recordati, Milan, Italy). *Boll Chim Farm* 106(11): 777-782, 1967.

Albino Pirbright and spotted guinea pigs were fed 3 different diets: commercial pellets (Altromin MS), commercial pellets supplemented by fresh vegetables; commercial pellets with 0.4 mg/ml ascorbic acid. In both animal strains the growth curve was higher with a commercial pellet and ascorbic acid diet than with commercial pellets alone or associated with fresh vegetables. At the age of 100-110 days the intestinal motility was studied *in vivo,* by Carminati's method. Recording of the peristaltic contraction rate and amplitude was started 15 min after the operation; after 1 hr the animals were injected with 10 μg/kg of prostigmin. Results showed a high intestinal motility with commercial pellets, and regular peristaltic waves with commercial pellets associated with ascorbic acid or with fresh vegetables. The Albino Pirbright guinea pigs were found to have a more efficient spontaneous motility than the spotted guinea pigs. Good intestinal motility depends upon both the strain of animals used and the type of diet administered.

4338 A METHOD OF ELECTROGRAPHIC DETERMINATION OF DUODENAL MOTORICITY UNDER EXPERIMENTAL CONDITIONS. *(Rus.)* Netesin, G. V. (N. N. Burdenko Gen. Clin. Milit. Hosp., USSR) and Yu. G. Shaposhnikov. *Eksp Khir Anest* 13(4):34-39, 1968.

To study bowel motor function and a method of electrographic recording of the biocurrents produced in the duodenum and ileum. Thin silver electrodes (0.3 x 0.4 cm) were implanted in the serous membrane of the intestinal wall and in the proximal and distal ends of the duodenum and ileum 50 cm from the cecum; 15-20 cm were allowed between electrodes. Bipolar leads were found the most satisfactory. Electrical activity in the musculature is dependent on intestinal contractions. There is a definite relationship between biocurrents and postoperative peristaltic activity. Two types of waves were observed: 1) rhythmic waves–high-frequency, low-amplitude (0, 1-2 microwaves), 2) peristaltic waves–low frequency, amplitude-1-8 microwaves. These latter depend on the tone of intestinal musculature. If there is inflammation present, muscular bioelectrical activity decreases. During digestion and after administration of neostigmine, it tends to rise at the expense of peristaltic amplitude, although the frequency of peristaltic waves remains constant. Atropine does not affect peristaltic frequency, but waves with an amplitude of over 4 microwaves disappear altogether.

4339 ROENTGENOCINEMATOGRAPHY OF THE MOTILITY OF THE APICO-BULBAR REGION OF THE DUODENUM. *(It.)* Sassi, P. (Inst. Radiol., U. Bologna, Italy). *Clin (Bologna)* 27(5):404-420, 1968.

The functional activity of the apical region of the duodenal bulb was studied by roentgenocinematography in 30 subjects (15 males, 15 females, aged 20-60 yr), who had no gastrointestinal pathology. Chronological relations of the movement of the gastric antrum and other regions of the duodenum were determined, and the phasic and tonic activity of the apical region was analyzed. In particular, the apical region appeared to be the site of a basal tonic activity which was regularly modified by phasic contractions. The region appeared clearly differentiated from all the other areas of the duodenum, where such tonic activity was missing. During mixing this region presented a persistent tonic contraction, thus it must be considered as a functional sphincter.

4340 THE RELATIONSHIP BETWEEN THE RECTUM AND THE ANAL CANAL AND THEIR EFFECT ON ANAL CONTINENCE. *(Fr.)* Tagart, R. E. B. (Newmarket Gen. Hosp., England). *Rev Med* 9(8):489-491, 1968.

4341 THE EFFECT OF SOME TYPES OF ANESTHETICS ON THE SECRETORY AND MOTOR FUNCTION OF THE STOMACH IN CHILDREN. *(Rus.)* Bilich, G. L. (Karaganda Munic. Pediat. Hosp. No. 1, USSR), V. S. Donchenko and M. V. Shedlovskaia. *Pediatriia* 47(2): 75-76, 1968.

4342 REMARKS ON THE GENERAL METHODOLOGY FOR THE STUDY OF THE MECHANICAL ACTIVITY OF THE INTESTINE. *(It.)* Torsoli, A. (2nd Gen. Med. Clin., U. Rome, Italy). *Arch Ital Mal Appar Dig* 35(4): 378-381, 1969.

4343 ELECTRICAL ACTIVITY OF SMALL INTESTINAL SMOOTH MUSCLE. *(Rev.)(E.)* Baker, R. D. (U. Texas Med. Br., Galveston). *Amer J Surg* 117(6): 781-797, 1969.

4344 RECENTLY STUDIED EFFECTS OF HISTAMINE ON STOMACH MOTILITY AND STOMACH SECRETION. *(It.)* Blasi, A. (Inst. Clin. Med., U. Catania, Italy), F. Marletta and F. Mangiafico. *Arch Ital Mal Appar Dig* 35(5):451-457, 1969.

4345 **CLINICAL PHYSIOPATHOLOGY IN DYSPEPSIA. STUDY OF THE ELECTRICAL ACTIVITY OF THE HUMAN DUODENUM.** *(It.)* Labò, G. (Inst. Spec. Med. Pathol., U. Bologna, Italy), L. Barbara and G. A. Lanfranchi. *Arch Ital Mal Appar Dig* 35(4):382-391, 1969.

4346 **MEASUREMENT OF THE ELECTRICAL ACTIVITY OF THE INTESTINES.** *(It.)* Crema, A. (Inst. Pharmacol. U. Pisa, Italy). *Arch Ital Mal Appar Dig* 35(4):375-378, 1969.

See also: 4333,4464,4565,4599,4648

SECRETION AND METABOLISM

4347 **PYRUVIC ACID, LACTIC ACID AND ALPHA-KETOGLUTARIC ACID IN CANCER PATIENTS.** *(Ger.)* Kronberger, L. (Surg. U. Clin., Graz, Austria) and E. Fink. *Med Klin* 63(22):944-948, 1968.

Determinations of pyruvic acid, lactic acid and alpha-ketoglutaric acid content in the blood of 46 nonmalignant cases (group A) and 59 malignant cases (group B) were performed and results compared. Diagnosis and tumor localization are given in tabular form; ages ranged from less than 20-90 yr of age (81.35% of the cancer patients were 51-80 yr of age). Group A included 14 cases of cholecystitis and 6 of duodenal ulcers. Included in group B were neoplasms of: the rectum, 11 cases; the colon, 10; and the pancreas, 2. No statistically significant difference was found between pyruvic acid (mean value 0.80 mg% in both groups) and lactic acid (mean value in Group A was 13.05 mg% and in group B 15.04 mg%). A statistically significant increase in serum alpha-ketoglutaric acid was noted in group B (0.34 mg%) over group A (0.18 mg%). This difference may be due to a citric acid cycle disorder. Substrate asparaginic acid decrease may be primarily responsible for this since it is closely associated with the tricarboxylic acid cycle. Evidence supports this view, since asparaginic acid in cancer patients is decreased by 90% and by sufficient substitution with K-Mg-aspartate normal levels of alpha-ketoglutaric acid levels can be achieved.

4348 **α-L-FUCOSYLTRANSFERASES IN HUMAN SUBMAXILLARY GLAND AND STOMACH TISSUES ASSOCIATED WITH THE H, Le^a AND Le^b BLOOD-GROUP CHARACTERS AND ABH SECRETOR STATUS.** *(E.)* Chester, M. A. (Lister Inst. Prev. Med., London, England) and W. M. Watkins. *Biochem Biophys Res Commun* 34(6): 835-842, 1969.

Submaxillary glands from 11 donors (5 group A and 4 group O secretors, and 2 A nonsecretors) and 3 stomach specimens (1 A, 1 B and 1 O secretor) were examined for fucosyltransferases. The tissues in which secreted blood group glycoproteins are synthesized, particle-bound α-L-fucosyltransferases are present with the specificities required for the formation of H, Le^a and Le^b specific structures. Persons who are secretors of ABH had 2-, 3- and 4-α-L-fucosyltransferases in submaxillary glands and stomach mucosal linings. Tissues from nonsecretor persons contained 3- and 4-α-L-fucosyltransferases.

4349 **ENHANCEMENT OF NET SODIUM TRANSPORT IN ISOLATED BULLFROG INTESTINE BY SUGARS AND AMINO ACIDS.** *(E.)* Quay, J. F. (Indian U. Sch. Med., Indianapolis) and W. M. Armstrong. *Proc Soc Exp Biol Med* 131(1):46-51, 1969.

Isolated adult bullfrog small intestine was mounted between identical Ringer's solutions and short circuit currents and tran mural potential differences measured to determine the effect of the substrates D-glucose, D-galactose, 3-O-methyl glucose, L-alanine, L-valine, and L-cysteine on net sodium transport. Addition of the actively transported solutes to the solution bathing the serosa of the bullfrog intestine did not, except for glucose, alter the potential difference or short circuit current across the tissue. As long as the sodium concentration of the medium was kept constant, both parameters were saturated at the same substrate concentration. When a second actively transported sugar was added after maximal stimulation of the short circuit current by another actively transported sugar no further effect was noted. However, a typical saturable increase in short circuit current could be obtained by adding gluco in the presence of a relatively high concentration of L-valine and vice versa.

4350 **DEUEL CONFERENCE ON LIPIDS (1968 PROCEEDINGS). THE TURNOVER OF LIPID AND LIPOPROTEINS.** Cowgill, G. (Pasadena, Calif.), D. L. Estrich and P. D. Wood. Bethesda, Md., Natl. Inst. Arthritis Metabol. Dis., NIH, 1969. 188 pp.

4351 **THE INFLUENCE OF BLOOD SUGAR LEVEL ON THE QUANTITATIVE ASSESSMENT OF ULCERS PRODUCED BY RESTRAINT METHOD IN THE STOMACH OF ALBINO RATS.** *(E.)* Ganguly, A. K. (Jawaharlal Inst. Postgrad. Med. Ed. Res., Pondicherry, India) S. K. Lal, S. D. Nishith and S. K. Sreepathi Rao. *Indian J Med Res* 57(2):295-300, 1969.

See also: 4332

Stomach

4352 **CORRELATIVE STUDY OF HYDROCHLORIC ACID, PEPSIN, AND INTRINSIC FACTOR SECRETION IN NEWBORNS AND INFANTS.** *(E.)* Agunod, M. (New York Med. Coll., N. Y.), N. Yamaguchi, R. Lopez, A. L. Luhby and G. B. J. Glass. *Amer J Dig Dis* 14(6):400-414, 1969.

The patterns of the secretion of hydrochloric acid, pepsin, and intrinsic factor were studied, after Histalog stimulation, in the gastric juice of 12 infants 12 hr to 3 months old. Ten infants in the 1-day-old group tested 12-24-hr after birth showed that in the first day of life, the output of hydrochloric acid, intrinsic factor, and pepsin was very low, but no instance of achlorhydria was found. The outputs of the 3 components then showed a gradual increase until the third week after birth, followed by a short decline in the third to fourth week, and a second sustained rise continuing into the second and third month of life. A good correlation was observed between the outputs of hydrochloric acid and intrinsic factor in gastric juice of the neonate following Histalog stimulation; and a somewhat poorer correlation between that of intrinsic factor and pepsin. When secretory outputs were recalculated for body weight, those of intrinsic factor in infants 2-3 months old were at levels comparable to that observed in older children and adults; those of hydrochloric acid, at the lower range of normal, or slightly below adult levels; and that of pepsin, well below adult values. Serial determinations showed intrinsic-factor activity in 1 infant to be well below that of other infants of comparable age.

4353 **EVIDENCE FOR THE RELEASE OF GASTRIC FIBRINOLYTIC ACTIVITY INTO PERIPHERAL BLOOD.** *(E.)* Cox, H. T. (Wythenshawe Hosp., Manchester, England). *Gut* 10(5):404-407, 1969.

Studies were performed on peripheral venous blood to determine whether the excess fibrinolytic activity demonstrated previously in gastric veins can reach and be demonstrated in the peripheral circulation. Digital gastric compression was performed at laparotomy in 12 patients with chronic duodenal ulcers, 4 patients with cholelithiasis and 2 patients without upper abdominal pathology. Fifty-nine serial specimens of peripheral venous blood and 44 of gastric venous blood were studied. There was demonstrated a plasmin-like activity in the peripheral veins and a progressive shortening of the euglobulin ysis time. Plasmin-like activity was found in at least 1 gastric vein specimen of every case but there was a gradation of activity, the higher levels being found in ulcer cases. The surgeon may be able to raise peripheral fibrinolytic activity and reduce postoperative thrombosis.

4354 **ANALYSIS OF SPONTANEOUS GASTRIC SECRETION IN THE NORMAL MUCOSA AND N DUODENAL ULCER. STUDY OF THE K25 INDEX AND ACID/ENZYME CORRELATION.** *(It.)* Allegra, G. C. Ospedale Maggiore, Novara, Italy). *Progr Med* 24(22): 865-872, 1968.

n 28 normal subjects and in 41 patients with duodenal ulcer, eterminations were made of gastric basal secretion (acid and nzyme) and secretion after a modified Kay's test. In 18 patients with duodenal ulcer, basal secretion and secretion after histamine stimulation were determined. A significant enzymatic predominance (expressed in mg of free tyrosine) was observed in the basal secretion in comparison to the histamine-stimulated secretion. A difference in the index of acid-enzyme correlation (K_{25}) was also observed. These data support the belief of the existence of two different types of duodenal ulcers: one in which the hypersecretion is vagal dependent, and the other in which it is dependent upon a gastrin-like stimulation.

4355 **EVIDENCE FOR A LIPASE SYSTEM IN CANINE GASTRIC JUICE.** *(E.)* Engstrom, J. F. (Dept. Med., Ohio State U. Coll. Med., Columbus), J. J. Rybak, M. Duber and N. J. Greenberger. *Amer J Med Sci* 256(6):346-351, 1968.

The effect of gastric juice, from dogs with isolated Heidenhain pouches, on the lipolysis of a medium chain triglyceride (trioctanoin) and a long chain triglyceride (tripalmitin) was studied using ^{14}C labeled lipids *in vitro*. It was clearly demonstrated that canine gastric juice contains a lipase system which hydrolyzes trioctanoin but not tripalmitin. The gastric lipase was about one-tenth as active as pancreatic lipase and had a pH of 6.0 to 7.0. The lipolytic activity of gastric juice was not due to pepsin or pancreatic lipase. If human gastric juice and gastric mucosa also contain a lipolytic system which is found to be active towards medium chain triglycerides, the finding would provide a further rationale for using medium chain triglycerides in treating various malabsorption disorders.

4356 **INFLUENCE OF PHENYLBUTAZONE ON GASTRIC SECRETION OF RADIOSULFATE IN THE RAT.** *(Fr.)* Andre, C. (Ed. Herriot Hosp., Lyon, France), R. Lambert, J. P. Leonard and F. Martin. *C R Soc Biol* 162(1): 104-107, 1968.

Male Wistar rats with chronic gastric cannula were injected i.p. with 40 μC of $^{35}SO_4Na_2$, and then with 100 mg/kg phenylbutazone i.m., a day for 3 days. During the pre-ulcerous phase, radiosulfate secretion was recorded. Phenylbutazone inhibited the incorporation of radiosulfate in most gastric-acid glycoproteins containing sulfate, precipitating at pH = 1.5 with cetylpyridinium. The values observed in treated rats were 28-54% above controls. The inhibitory effect was less marked when total gastric elimination of undialysable radiosulfate, or the total elimination of radiosulfate was considered. This inhibitory activity is considered to be a biologic characteristic preceding the appearance of the medicamentous ulcer.

4357 **ANTERIOR HYPOTHALAMIC REGULATION OF GASTRIC SECRETION.** *(E.)* Davis, R. A. (U. Pennsylvania Sch. Med., Philadelphia) and S. Weiner. *Surg Gynec Obstet* 128(5):1007-1015, 1969.

Chronic gastric fistulae were constructed in 33 beagles weighing 10 to 14 kg. Baseline values for fasting, post-insulin (i.v. 1.5 U/kg) and intra- and post-histamine (i.v. 3.6 μg/kg/min for 2 hr) stimulation were obtained for gastric acid volume and concentration. Bilateral hypothalamic lesions were then made in the paraventricular nuclei of 6 dogs and in the fornices and medial forebrain bundles of 6 others. There was little fasting acid secretion under normal circumstances or following paraventricular nuclei lesions. Lateral anterior hypothalamic lesions increased both gastric acid volume and concentration maximally in a month. Insulin hypoglycemia stimulated gastric secretion in direct proportion to the dose administered and usually was maximal in 30-60 min after administration when the blood sugar was 40 mg%. Only eight biphasic hypoglycemic responses were noted and none of the late phase increases in gastric secretion was associated with elevated steroid levels. Medial hypothalamic lesions did not affect the gastric secretion response to hypoglycemia. Lateral lesions reversed and abolished the gastric response to insulin hypoglycemia. Fasting plasma steroid levels were increased 1 month after lateral lesions. Neither medial nor lateral hypothalamic lesions affected the maximal 30 min acid output of histamine.

4358 **STUDIES ON HUMAN GASTRIC INTRINSIC FACTOR. I. PURIFICATION OF INTRINSIC FACTOR FROM HUMAN GASTRIC JUICE.** *(E.)* Morishita, R. (Fac. Med., Kyoto U., Japan). *J Vitamin (Kyoto)* 15(1): 83-93, 1969.

Pepsin-inactivated neutralized normal human gastric juice was saturated or partially saturated with radioactive vitamin B_{12} and purified by sequential column chromatography using Sephadex G-100 gel, DEAE-cellulose and Sephadex G-50 gel. The purified materials obtained were intrinsic-factor-active (Schilling test) in a total gastrectomy patient. This material had an approximate 60-fold increase in vitamin B_{12} binding capacity as compared with the dialyzed gastric juice. The final product was homogeneous on ultracentrifugal analysis, and showed a sedimentation coefficient of 10.5 S, with an estimated molecular weight of about 150,000. It was composed of 16 amino acids, with relatively high amounts of threonine, serine, proline, glutamic acid, glycine, alanine and aspartic acid. The minimal molecular weight of fraction III was about 10,000.

4359 **AN INVESTIGATION OF ANTIHISTAMINIC ACTIVITY AND GASTRIC ULCERATION.** *(E.)* Alphin, R. S. (A. H. Robins Res. Lab., Richmond, Va.) and J. W. Ward. *Europ J Pharmacol* 6(1):61-66, 1969.

Gastric ulcers were produced in 163 albino guinea pigs by histamine and in 40 English short-hair guinea pigs by restraint procedures. Pyloric ligation and reserpine were used in Sprague-Dawley rat experiments (68). Brompheniramine, 3-p-chlorobenzhydryloxy-1-methylpyrrolidine HCl, tripelenamine HCl, cyproheptadine HCl and promethazine HCl were effective in preventing histamine-induced ulceration in guinea pigs. Glycopyrrolate, a potent anticholinergic, was ineffective. Brompheniramine, the most potent antihistamine (against histamine-induced ulceration), was further studied for its effects on gastric ulceration induced by other procedures. In restraint-induced ulcers in guinea pigs, the drug was without protective effect. When gastric ulceration was produced in rats by pyloric ligation or reserpine, this antihistamine, in contrast to glycopyrrolate, did not have a protective action. Several antihistamines are effective antagonists to histamine-induced gastric ulceration in guinea pigs. The effectiveness of certain agents (antihistaminic or anticholinergic) in preventing gastric ulceration is probably dependent on the method used to produce the ulceration.

4360 **EFFECT OF PROLONGED INTRAVENOUS INFUSION OF DEXTRAN ON GASTRIC SECRETION OF RATS BEARING PERMANENT GASTRIC FISTULAS.** *(E.)* Kowalewski, K. (Surg. Med. Res. Inst., U. Alberta, Edmonton, Canada) and G. Chmura. *Arch Int Pharmacodyn* 177(2):407-415, 1969.

Adult male Wistar rats (24) with permanent gastric fistula and permanent cannula inserted into the vena cava, on 24 hr i.v. infusion showed significantly lower output of gastric juice, HCl and pepsin in dextran-infused rats than in saline-infused rats. The infusion rate was 120 ml/kg body weight/24 hr. Gastric content was collected in 6 and 18 hr fractions for 24 hr. In a control group of 24 rats significant hyperhistaminemia was found in dextran-infused rats in 30 min, 1 hr, and 6 hr samples.

4361 **DELAYED HYPERSENSITIVITY REACTIONS IN THE INTESTINAL TRACT. III. PIG STOMACH GASTRITIS AND PARIETAL CELL ANTIBODIES.** *(E.)* Bicks, R. O. (U. Tennessee Coll. Med., Memphis), M. M. Azar, G. F. Bale, E. W. Rosenberg and J. Goldenberg. *Amer J Dig Dis* 14(6):385-393, 1969.

A chronic delayed hypersensitivity reaction was produced in the pig stomach. In skin-sensitized animals 2,4-dinitrochlorobenzene (DNCB) in adhesive paste produced mucosal ulceration with intestinalization, edema, and marked round-cell infiltration of the submucosa, vascular congestion, perivascular cuffing, and fibrinoid arteriolar changes. When pigs that were not skin-sensitized were given DNCB in adhesive paste, no mucosal ulceration was seen. A similar but less intense cellular infiltrate and vascular change was present. Circulating antibodies to DNCB showed no relationship to the morphological lesion, while parietal cell antibody immunofluorescent titers paralleled the intensity of the tissue response. Under the conditions of this experiment, parietal cell antibodies were not involved in the pathogenesis of the mucosal lesion.

4362 **INFLUENCE OF BLOOD GROUP AND SECRETOR STATUS ON GASTRIC ACIDITY.** *(E.)* Jori, G. P. (Inst. Med. Pathol., U. Naples, Italy), G. Mazzacca, C. Balestrieri, R. P. Donnorso, B. Gallo and M. Mansi. *Amer J Dig Dis* 14(6):380-384, 1969.

Total output of gastric acid after maximal histamine stimulation was evaluated in 515 patients (220 males and 295 females, aged 20-50 yr) with or without a familial history of duodenal ulcer but free of gastroduodenal disease. HCl output was found to be significantly higher in patients of blood group O than in those of A, B, and AB, irrespective of family history of duodenal ulcer. HCl output was also significantly higher, in patients who were in blood group O, in nonsecretors than in salivary ABH secretors. In blood groups A, B, and AB there were no differences between secretors and nonsecretors. Increased levels of acid secretion may partially explain the high incidence of duodenal ulcer among subjects with one or both the phenotypic traits; blood group O and nonsecretors.

4363 **ROLE OF GASTRIC SECRETION IN IRON ABSORPTION.** *(E.)* Jacobs, A. (Welsh Natl. Sch. Med., Cardiff, Wales) and P. M. Miles. *Gut* 10(3):226-229, 1969.

Various buffered ferrous (sulfate, gluconate and glycine sulfate) and ferric (citrate, ammonium sulfate and chloride) salts were found to precipitate out completely by increasing the pH of the solution to 7. This precipitation was prevented by the formation of soluble complexes after the addition of fresh or incubated gastric juice. Similar complexing agents are found in hog stomach extract and intrinsic factor concentrate. Pepsin showed similar activity as did histadine in a 0.1 M solution, but glutamic acid at the same concentration was ineffective in preventing precipitation at pH 7. Gel filtration studies suggest that the iron is bound in a complex with a molecular weight of 200,000 that may include a mucopolysaccharide or a polymer derived from a smaller complex.

4364 ROLE OF THE VAGUS NERVE IN THE RELEASE OF ANTRAL GASTRIN IN THE DOG. *(E.)* Molina, J. E. (U. Minnesota Med. Sch., Minneapolis), W. P. Ritchie Jr., R. F. Edlich and O. H. Wangensteen. *Surgery* 63(3):467-474, 1968.

A study of gastric acid secretion induced by electrical stimulation of the distal portion of the transected thoracic vagus nerve was carried out in 6 groups of mongrel dogs. Group 1 consisted of 37 control dogs which were intact, i.e. the antrum was in continuity with the corpus. Stimulation of the distal vagus nerve for 15 min elicited a gastric acid secretory response beginning shortly after initiation of stimulation and lasting 3-4 hr after cessation. Peak acid output of 0.3-0.4 mEq free acid/15 min was reached 90-120 min after initiation. Group 2 consisted of 10 dogs which had undergone antrectomy 4-10 weeks before, continuity of the gastrointestinal tract being restored by a Billroth I type gastroduodenostomy. Vagal stimulation never resulted in significant acid production in this group even though action potentials were clearly evoked from the vagus nerve. Group 3 (7 dogs) was provided with Heidenhain-type, denervated fundic pouches before stimulation, the antrum remaining *in situ.* Acid secretion from the main stomach was similar in amount and duration to that in Group 1, but secretion did not begin until 35-40 min later and persisted for an average of only 45 min. The 8 dogs in Group 4 were provided with innervated fundic pouches of the Pavlov type, the antrum again remaining *in situ.* Acid production by the pouch began simultaneously with that of the stomach and persisted for 2 hr. (More acid was produced by the innervated pouches than by denervated pouches under identical conditions.) In the 7 dogs of Group 5 excluded but innervated antral pouches were constructed in which only the external layers of the upper half of the pouch were connected to the main stomach, the lumina being separated by a mucosal bridge, while the lower half was completely separated. The stomach was then anastomosed to the proximal jejunum in the Billroth II manner. Denervated fundic pouches of the Heidenhain type were also provided. These dogs secreted acid from the main stomach in a manner similar to the control Group 1, but the average peak output was somewhat lower. Acid output in the Heidenhain pouch was also less than control values. In Group 6, the 6 dogs were provided with excluded denervated antral pouches in which the continuity with the stomach and surrounding structures is disrupted, leaving the antrum pedicled only on the left gastropiploic vessels. No significant amounts of acid were produced in this group. The response resembled that of the antrectomized animals. A single 15-min stimulation to the distal portion of the transected thoracic vagus nerve provokes acid production in the stomach as long as an innervated antrum is retained.

4365 THE PRESENCE OF HYDROXY FATTY ACIDS IN SPHINGOMYELINS OF BOVINE RENNET STOMACH. *(E.)* Karlsson, K.-A. (Inst. Med. Biochem., Göteborg, Sweden), K. Nilsson, B. E. Samuelsson and G. O. Steen. *Biochem Biophys Acta* 176(3):660-663, 1969.

Sphingomyelins in bovine rennet stomach mucosa were quantitated by paper chromatography following extraction of lipids by chloroform-alcohol, alkaline degradation, acidification and removal of acidic lipids using a DEAE cellulose column. There were 8.7 mg of sphingomyelin/g dry tissue weight. By phospholipase C treatment, the sphingomyelins were quantitatively hydrolyzed to ceramides and phosphorylcholine. Further purification of the ceramides by thin-layer chromatography on silicic acid revealed a fast-moving group which contained normal fatty acids and a slower-moving group which contained 2-hydroxy fatty acids. The ratio between normal and hydroxy fatty acids in the total ceramides was about 3:1. Methylation of the hydroxy ester fraction and comparison to a similar fraction and comparison to a similar fraction from bovine brain cerebrosides suggested a D configuration for the 2-hydroxy fatty acids of bovine rennet stomach sphingomyelins.

4366 EXPERIMENTAL STUDY ON THE RELATIONSHIP BETWEEN HYPERAMMONEMIA AND GASTRIC SECRETION. *(E.)* Mattioli, F. (Dept. Clin. Surg., U. Genoa, Italy), G. Becchi and G. C. Torre. *Gaz Int Med Chir* 74(12):1050-1053, 1969.

Gastric juice quantity, HCl content, and pH were determined on collections from dogs fitted with Heidenhain gastric pouches; after fasting, meat feeding, and s.c. histamine injection. The entire series was repeated after i.v. administration of 1% solution of ammonium chloride. There was a consistent rise in total quantity, free and combined HCl; and diminution of the pH in the gastric juice of the animals treated with ammonium chloride compared with the controls. These results provide clear evidence of a relationship between hyperammonemia and increased gastric acid secretion in dogs.

4367 INCOAGULABLE NITROGEN FRACTIONS IN THE HUMAN GASTRIC CONTENTS. V. STUDIES DURING CATHETER-STIMULATED SECRETION. *(It.)* Smilari, L. (Inst. Gen. Med. Clin., U. Catania, Italy), G. Modica and F. Marletta. *Riforma Med* 82(26):712-715, 1968.

4368 SECRETION AND THE STRUCTURE OF THE GASTRIC MUCOSA AFTER EXPERIMENTAL THYROIDECTOMY. *(Rus.)* Lipovskii, S. M. (Leningrad Inst. Sanit.-Hyg. Med., USSR). *Pat Fiziol Eksp Ter* 12(1):85-86, 1968.

4369 GASTRIC SECRETION AFTER ADMINISTRATION OF DIMETHYLBIGUANIDE IN NORMAL AND DIABETIC SUBJECTS. *(It.)* Ferlito, S. (Inst. Spec. Med. Path., U. Catania, Italy), M. Calafato and F. Romano. *Riv Gastroent* 20(2):71-85, 1968.

4370 THE GASTRIC CHEMISTRY DURING TREATMENT OF PULMONARY TUBERCULOSIS WITH A NEW KIND OF ORALLY ACTIVE RIFAMYCIN. *(It.)* Giordano, F. (C. Forlanini Sanat. Hosp., Rome, Italy), M. Sebastiani and M. Tiraterra. *Riv Tuberc* 16(3):304-309, 1968,

4371 CLINICAL AND EXPERIMENTAL STUDY OF THE ACID-FORMING FUNCTION OF THE STOMACH (RADIOTELEMETRY COMBINED WITH ELECTROMETRIC TITRATION). *(Rus.)* Kalinichenko, V. V. (S. M. Kirov Acad. Milit. Med., Leningrad, USSR), R. A. Sorokin and M. V. Shinkevich. *Lab Delo* (4):210-213, 1968.

4372 DETERMINING THE DIGESTIVE ACTIVITY OF THE GASTRIC JUICE WITH CATGUT. *(Rus.)* Dubich, S. Ia. (Dnepropetrovsk Gastroent. Res. Inst., USSR). *Lab Delo* (5):288-289, 1968.

4373 PROBLEM OF HYDROCHLORIC ACID FORMATION IN THE STOMACH. *(Rev.)(E.)* Nowinski, W. W. (U. Texas Med. Br., Galveston). *Amer J Surg* 117(6):768-770, 1969.

4374 DUODENAL INHIBITION OF GASTRIC SECRETION. *(Rev.)(E.)* Dragstedt, L. R. (Dept. Surg., U. Florida, Gainesville). *Amer J Surg* 117(6):841-848, 1969.

4375 PHYSIOLOGIC MECHANISMS INHIBITING GASTRIC SECRETION OF ACID. *(Rev.)(E.)* Andersson, S. (Karolinska Inst., Stockholm, Sweden). *Amer J Surg* 117(6):831-840, 1969.

4376 ROLE OF THE VAGUS NERVES IN THE PHYSIOLOGY OF GASTRIC SECRETION. *(Rev.)(E.)* Dragstedt, L. R. (Dept. Surg., U. Florida, Gainesville). *Amer J Surg* 117(6):813-821, 1969.

4377 PHYSIOLOGY OF GASTRIN. *(Rev.)(E.)* Jordan, P. H. Jr. (Baylor U. Coll. Med., Houston, Tex.) and R. Garcia-Rinaldi. *Amer J Surg* 117(6):822-830, 1969.

4378 GASTRIN INHIBITION OF GASTRIC SECRETION BEFORE AND AFTER PORTACAVAL SHUNT. *(E.)* Wilken, B. J. (U. Mississippi Med. Ctr., Jackson), D. Hunt, C. F. Lowe, W. A. Billups and J. D. Hardy. *Surg Gynec Obstet* 129(1):22-26, 1969.

4379 EVALUATION OF THE ANTISECRETORY EFFECT OF A NEW ANTICHOLINERGIC AGENT–HETERONIUM BROMIDE. *(E.)* Goodman, S. (U. Cincinnati Coll. Med., Ohio), F. E. Smyrniotis and A. Funahashi. *Amer J Dig Dis* 14(5):305-314, 1969.

4380 THE EFFECT OF SUSTAINED RELEASE HEXOCYCLIUM TABLETS ON GASTRIC ACID SECRETION. *(E.)* Alp, M. H. (Queen Elizabeth Hosp., Woodville, S. A.) and A. K. Grant. *Med J Aust* 1(9):447-449, 1969.

4381 ON GASTRIC ANALYSES. *(Fin.)* Tarpila, S. *Suom Lääk* 24(19):1683-1685, 1969.

4382 GASTRIC MUCUS AND THE GASTRIC MUCOUS BARRIER. A REVIEW. *(E.)* Menguy, R. (Pritzker Sch. Med., Chicago, Ill.). *Amer J Surg* 117(6):806-812, 1969.

4383 INVESTIGATIONS CONCERNING THE COMPARATIVE ACTION OF OXYTOCIN ON GASTRIC SECRETION IN DOGS AND HUMANS. *(Rum.)* Groza, P. (D. Danielopolu Inst. Norm. Pathol. Physiol., Romania), M. Corneanu, A. Oana, S. Ionescu and L. Rusovici. *Fiziol Norm Pat* 13(6):509-514, 1967.

4384 THE EFFECTS OF INDUCED HYPERCALCEMIA ON HUMAN GASTRIC SECRETION COMPARISON TO THE RESPONSE TO MAXIMUM HISTAMINE. *(Sp.)* Milanese, J. C. (Hosp. Ramos Mejía Buenos Aires, Argentina) and C. J. Morel. *Rev Argent Cir* 13(1-2-3):49-52, 1967.

See also: 4341,4344,4348,4556,4581,4644,4646,4656,4715,5019

Pancreas

4385 THE PATH OF PANCREATIC AMYLASE. *(Sp.)* Angelillo-MacKinlay, T. (Massachusetts Gen. Hosp., Boston) and G. L. Nardi. *Rev Argent Cir* 13(1-2-3):17-20, 1967.

Experiments were done on 22 dogs (females, 12-14 kg body weight) to determine the participation of the portal and lymphatic systems in pancreatic amylase transport. Animals were prepared surgically in the following way: 1) cannulation of the thoracic duct, the main pancreatic duct and the portal and femoral veins, and 2) constant stimulation with secretin and pancreozymin during 3 hr. The animals were divided into 4 groups in which the first hr of stimulation in each was used as control. 1) Stimulation for 3 hr without introduction of any variants showed no significant changes in the 3 elements studied (systemic blood, portal blood, lymph), 2) After 1 hr of stimulation ligation of the pancreatic duct was performed. There was a significant increase in portal and systemic amylemia. Increase in amylase activity was also found in lymph, but not as much as in the blood, 3) After 1 hr of stimulation ligation of the thoracic duct was performed. No significant changes were noted, 4) After 1 hr of stimulation experimental pancreatitis was induced by the injection of 8 ml of autogenous bile into the pancreatic duct. There was a very significant increase of amylase in both blood and lymph. The lymphatic system appears to play an important role in amylase transport in both physiological and pathological conditions.

4386 INTERACTION OF BASIC PANCREATIC TRYPSIN INHIBITOR WITH TRYPSINOGEN. *(E.)* Dlouha, V. (Czechoslovak Acad. Sci., Prague) and B. Keil. *Febs Letters* 3(2):137-140, 1969.

Determinations were made by gel filtration on Sephadex G-50 of the binding affinity of trypsinogen, DIP-trypsin (di-isopropylphosphoryltrypsin), chymotrypsinogen and DIP-chymotrypsin for basic pancreatic trypsin inhibitor (BPTI). The formation of the complex was observed only in the case of trypsinogen. The trypsinogen to BPTI ratio in the complex was 1:1. The inhibitory activity assays clearly show that the addition of trypsin results in the liberation of the inhibitor from the complex with trypsinogen, and that the inhibitor then inhibits the active enzyme. The binding affinity of trypsin for BPTI is therefore greater than the binding affinity of trypsinogen.

4387 EXTERNAL PANCREATIC RESPONSE TO FOOD AND ITS RELATION TO THE MAXIMAL SECRETORY CAPACITY IN DOGS. *(E.)* Henriksen, F. W. (U. Copenhagen, Denmark) and H. Worning. *Gut* 10(3):209-214, 1969.

In 4 mongrel dogs (19 to 20 kg) the pancreatic secretion of fluid, bicarbonate, and protein after ingestion of a meat meal were studied under conditions approximating those of the normal postprandial period. The secretion rates for fluid and bicarbonate were lower in the initial 30 min than in the next 2½ hr, during which they usually remained at a constant level. The secretion rate for protein was highest in the initial 30 min, probably on account of a 'washout' phenomenon, and remained at a constant, but lower level in the next 2½ hr. Secretion varied considerably from day to day in each dog, the bicarbonate concentration varied least. The secretion rate for protein varied less than did the secretion rates for fluid and bicarbonate. The mean secretion rates for fluid and bicarbonate were about one third the maximal secretion rates obtainable with combined stimulation with secretin and pancreozymin. The mean secretion rate for protein attained one fifth of the maximal rate.

4388 ALTERATIONS OF PORTAL VENOUS AND SYSTEMIC ARTERIAL PRESSURE DURING EXPERIMENTAL ACUTE PANCREATITIS. *(E.)* Anderson, M. C. (Northwestern U. Med. Sch., Chicago, Ill.), W. R. Schiller and L. Gramatica. *Amer J Surg* 117(5):715-720, 1969.

Experimental acute pancreatitis produced in 29 healthy dogs was associated with changes in portal venous and systemic arterial hemodynamics. Trypsin or trypsin-blood incubation mixtures infused into the pancreatic ductal system produced a prompt elevation of portal pressure and simultaneous reduction of systemic arterial pressure. Intraductal infusions of lipase, lipase-blood incubates, or phospholipase-A were associated with less impressive changes in portal pressure whereas systemic hypotension was usually more pronounced. The explanation for these peripheral circulatory alterations is not entirely clear although phospholipase-A is a known central nervous system toxin and therefore may produce a generalized loss of vasomotor tone. A variety of enzymes or blood-enzyme incubation mixtures, which are potentially important in the initiation of pancreatitis, also cause profound changes in the circulation to and from the inflamed gland. Depending on the magnitude of this hemodynamic response, both portal hypertension and systemic hypotension can be expected to have an adverse effect on the course of the local inflammatory process.

4389 THE BEHAVIOR OF SERUM AMYLASE IN NORMAL, PANCREATECTOMIZED, AND PANCREAS-TRANSPLANTED DOGS. *(Ger.)* Largiader, F. (Surg. U. Klinik A, Zurich, Switzerland), H. Rosenmund and A. Jakob. *Schweiz Med Wschr* 98(9):323-327, 1968.

Serum amylase determinations in 60 healthy, fasting dogs gave a normal value of 1802 ± 1055 Somogy U. Ten dogs were subjected to duodenopancreatectomy and the serum amylase values fell below the norm in 6 of 10 during the first 3 days. In 4 dogs treated with hypotonic infusions and surviving 16-35 days, serum amylase values remained in the lower normal range. After homotransplantation of the pancreas into duodenopancreatectomized hosts (18 dogs) an early rise in amylase values was seen once in association with acute pancreatitis and later in several cases associated with complications of the bile ducts, complete destruction of the transplant due to thrombosis, and in the course of immunological rejection. No decrease in serum amylase followed removal of the pancreas and an increase in serum amylase was not always caused by the pancreas; therefore, organs other than the pancreas must contribute significantly to amylase production.

4390 ARTERIAL INFUSION OF ANTIENZYMES IN THE TREATMENT OF EXPERIMENTAL PANCREATITIS. *(E.)* Nugent, F. W. (Lahey Clin. Found., Boston, Mass.), M. B. Bulan and S. Zuberi. *Amer J Dig Dis* 14(6):415-419, 1969.

Direct arterial infusion of high doses of Trasylol (8750 U/pound for 30 min) resulted in a dramatic decrease in mortality rate (79% untreated to 13% in treated) in experimental (trypsin-induced) pancreatitis in dogs. There was no significant histologic pancreatitis in the treated animals at 12 weeks after the procedure.

4391 **PROTEOLYTIC AND LIPOLYTIC DEFICIENCY OF THE EXOCRINE PANCREAS. [CASE REPORT]** *(E.)* Townes, P. L. (U. Rochester Sch. Med. Dent., N. Y.). *J Pediat* 75(2):221-228, 1969.

4392 **RELATIONSHIP BETWEEN LIPASE AND ESTERASE.** *(Jap.)* Okuda, H. (Tokushima U. Sch. Med., Japan). *Shikoku Acta Med* 25(1):192-200, 1969.

4393 **BIOLOGICAL MANIFESTATIONS OF PANCREATIC DISORDERS (EXCLUDING DISTURBANCES OF GLYCOGEN REGULATION).** *(Fr.)* Christoforov, B. *Concours Med* 91(15 Suppl.):31-40, 1969.

4394 **EXOCRINE PANCREAS. PHYSIOLOGY–APPLICATIONS. PHYSIOLOGY OF THE EXOCRINE PANCREAS.** *(Fr.)* Modigliani, R. *Concours Med* 91(15 Suppl.):3-29, 1969.

4395 **TRANSMETHYLASE ACTIVITY IN THE PANCREAS OF MAMMALS.** *(It.)* Sussi, P. L. (Inst. Chem. Biol., U. Padua, Italy). *Boll Soc Ital Biol Sper* 44(5):394-395, 1968.

4396 **THE ROLE OF PLASMA KININ IN FUNCTIONAL VASODILATATION IN THE PANCREAS.** *(E.)* Hilton, S. M. (Natl. Inst. Med. Res., London, England) and M. Jones. *J Physiol* 195(3):521-533, 1968.

4397 **A STUDY OF THE COMPLEX OF TRYPSIN WITH ITS PANCREATIC INHIBITOR.** *(E.)* Dlouhá, V. (Czechoslovak Acad. Sci., Prague), B. Keil and F. Šorm. *Biochem Biophys Res Commun* 31(1):66-76, 1968.

4398 **TEMPERATURE-DEPENDENT ACTIVATION OF TRYPSIN BY CALCIUM.** *(E.)* Sipos, T. (Dept. Chem., Lehigh U. Bethlehem, Pa.) and J. R. Merkel. *Biochem Biophys Res Commun* 31(4):522-527, 1968.

4399 **HYDROLYSIS OF PRIMARY AND SECONDARY ESTERS OF GLYCEROL BY PANCREATIC JUICE.** *(E.)* Mattson, F. H. (Proctor & Gamble Co., Cincinnati, Ohio) and R. A. Volpenhein. *J Lipid Res* 9(1):79-84, 1968.

4400 **MECHANISMS OF PANCREATIC EXOCRINE SECRETION.** *(E.)* Dreiling, D. A. (Mt. Sinai Med. Sch., New York, N. Y.). *Amer J Gastroent* 52(1):17-24, 1969.

See also: 4842

Hepatobiliary Tract

4401 ALLYL FORMATE POISONING IN EXPERIMENTALLY INDUCED LIVER REGENERATION. *(Ger.)* Rabes, H. (Inst. Pathol., U. Munich, Germany), H. V. Tuczek and H. Brändle. *Klin Wschr* 46(8):450-451, 1968.

One ml/100 g body weight of a 0.7% solution of allyl formate was injected i.p. into rats 3 hr before a partial hepatectomy. To evaluate DNA synthesis, 0.8 μC ^3H-thymidine/g body weight was injected at different intervals after hepatectomy and 60 min later the liver was excised. The amount of DNA synthesized in cells in partially hepatectomized rats increased significantly 18-20 hr after the operation, but decreased after 27 and 34 hr. In allyl-formate-poisoned-animals the onset of DNA synthesis in liver parenchymal cells was delayed by about 10 hr and reached a peak after 34 hr. The acinoperipheral necrosis of liver parenchyma affected DNA synthesis in the liver lobes at different rates. To compensate for the decreased peripheral regeneration due to necrosis, the ^3H thymidine labeling index of parenchymal cells greatly exceeds the values of normal regeneration in the medial and central parts of liver lobes.

4402 CONTROL OF GLUCONEOGENESIS IN LIVER. IV. DIFFERENTIAL EFFECTS OF FATTY ACIDS AND GLUCAGON ON KETOGENESIS AND GLUCONEOGENESIS IN THE PERFUSED RAT LIVER. *(E.)* Exton, J. H. (Dept. Physiol., Vanderbilt U., Nashville, Tenn.), J. G. Corbin and C. R. Park. *J Biol Chem* 244(15):4095-4102, 1969.

Using isolated perfused rat liver, it was found in many situations that fatty acids increased ketogenesis but not gluconeogenesis (using oleate in complex with albumin and unbound oleate). Fatty acids increased glycogenolysis only when present in an unbound form and at relatively high concentration, thus it is very unlikely that they are involved in the regulation of cyclic AMP under physiological conditions. (Unbound oleate frequently produced detectable increases in tissue cyclic AMP.) Unbound octanoate infused at 5 μM/min increased ketogenesis, glycogenolysis, gluconeogenesis, and cyclic AMP accumulation. Results using carnitine suggest that the level of endogenous carnitine in the perfused liver is not limiting for ketogenesis. In contrast to the effects of fatty acids, glucagon increased gluconeogenesis from lactate more than 2-fold but did not stimulate ketogenesis in livers from fed or fasted rats. The gluconeogenic effect of oleate-albumin complex or unbound oleate was additive with that of a maximally effective concentration of glucagon. It is concluded that fatty acids probably do not play a physiological role in the rapid regulation of hepatic carbohydrate metabolism, and that glucagon does not stimulate gluconeogenesis by activating hepatic lipolysis. The physiological regulation of ketogenesis appears to involve primarily the control of fatty acid supply to the liver, i.e., the regulation of lipolysis in fat tissue. Regulation by glucagon at the hepatic level is of minor importance.

4403 HEPATIC DRUG METABOLISM IN TEN STRAINS OF NORWAY RAT BEFORE AND AFTER PRETREATMENT WITH PHENOBARBITAL. *(E.)* Page, J. G. (Natl. Heart Inst., Bethesda, Md.) and E. S. Vesell. *Proc Soc Exp Biol Med* 131(1):256-261, 1969.

Ten strains (8 inbred and 2 outbred) of *R. norvegicus* as well as wild Norwegian rats and kangaroo rats were sacrificed before and after 3 days of i.p. phenobarbital (50 mg/kg/24 hr in kangaroo rats, 100 mg/kg/g 24 hr for the others) to evaluate hepatic aniline hydroxylase and ethylmorphine N-demethylase activities. Controls were injected with saline. In the 9000 g liver supernatant wild Norway rats resembled domestic Norway rats in their metabolism of these compounds, but in the microsomal fractions wild rats had lower V_{max} for ethylmorphine N-demethylase and higher K_m than 10 domestic strains. Male Norway rats metabolized ethylmorphine 50 to 300% more rapidly than females, but in only 3 strains were similar sex differences noted for aniline. In kangaroo rats females metabolized both drugs more rapidly. In strains of domestic rat, phenobarbital pretreatment elevated ethylmorphine metabolism 2 to 3.8-fold; aniline metabolism increased 1.5 to 3.5-fold. Wild strains may have less hepatic microsomal drug-metabolizing activity than domestic strains of the same species.

4404 EFFECT OF HYPER- AND HYPOINSULINISM ON THE METABOLISM OF ETHANOL IN RAT LIVER. *(E.)* Rawat, A. K. (U. Biochem. Inst. A., Copenhagen, Denmark). *Europ J Biochem* 9(1):93-100, 1969.

Administration of insulin to normal fed male Wistar rats resulted in a significantly increased rate of ethanol oxidation by liver slices (compared to control animals) while the rate from alloxan diabetic and anti-insulin serum treated rats was significantly lower than normal. Administration of ethanol to normal, insulin treated and alloxan diabetic animals caused a similar relative increase in the NADH/NAD ratio. After ethanol administration to alloxan diabetic rats, the hepatic redox state was very much reduced. Injection (i.v.) of ethanol (1.5 g/kg) after 30 min resulted in significantly increased concentration of plasma free fatty acids which, like that of alloxan diabetic and anti-insulin serum treated animals was significantly lowered following insulin injection. The total activities of hepatic alcohol dehydrogenase and aldehyde dehydrogenase were significantly decreased after alloxan treatment, but in the insulin treated group were the same as those of control animals. Partially purified rat liver alcohol dehydrogenase and aldehyde dehydrogenase were inhibited by free fatty acids, with laurate showing a stronger inhibitory effect than palmitate and oleate. The inhibition of alcohol dehydrogenase was competitive with respect to alcohol, of aldehyde dehydrogenase with respect to aldehyde, neither with respect to NAD. Addition of laurate (0.8 mM) to liver slices caused a significant decrease in the ethanol oxidation rate.

4405 REGULATION OF GLUCONEOGENESIS AND LIPOGENESIS. THE REGULATION OF MITOCHONDRIAL PYRUVATE METABOLISM IN GUINEA-PIG LIVER SYNTHESIZING PRECURSORS FOR GLUCONEOGENESIS. *(E.)* Somberg, E. W. (Dept. Zoology Physiol., Newark Coll. Arts Sci., Rutgers U., Newark, N. J.) and M. A. Mehlman. *Biochem J* 112(4):435-447, 1969.

The results of this study of the carboxylation of pyruvate to oxaloacetate by pyruvate carboxylase in guinea-pig liver mitochondria indicate that guinea-pig liver pyruvate carboxylase contributes significantly to gluconeogenesis and that fatty acids and metabolites play an important role in its regulation. The carboxylation was determined by measuring the amount of ^{14}C from H^{14}CO$_3$-fixed into organic acids in the presence of pyruvate, ATP, Mg^{2+} and P$_i$. The synthesis of phosphoenolpyruvate from pyruvate and bicarbonate is minimal during continued oxidation of pyruvate. In the presence of added oxaloacetate, guinea-pig liver mitochondria synthesized phosphoenolpyruvate in amounts sufficiently high to play an appreciable role in gluconeogenesis. Addition of fatty acids of increasing carbon chain length caused a strong inhibition of pyruvate oxidation and phosphoenolpyruvate formation, and greatly promoted carbon dioxide fixation, and malate, citrate and acetoacetate accumulation.

4406 THE RELATIONSHIP BETWEEN DIET AND COMPOSITION OF BLADDER BILE IN MICE. *(E.)* Dam, H. (Polytechnic Inst., Copenhagen, Denmark), F. Christensen and I. Prange. *Z Ernaehrungswiss* 9(2-3):200-208, 1969.

Three groups of young white mice (strain NMRI) were reared on synthetic diets without added fat, consisting of casein 20%, carbohydrate 74.3%, salt mixture 5%, vitamin mixture 0.5%, and choline chloride 0.2%. Group I received the carbohydrate entirely in the form of glucose, group 2 received the carbohydrate in the form of 62.3% glucose + 12% rice starch, and group 3 received the carbohydrate entirely in the form of rice starch. After having received the diets for 42-45 days the mice were killed and their bladder bile analyzed quantitatively with respect to cholesterol, lipid-soluble phosphorus and taurine-conjugated bile acids. There was no evidence that the diet in which all the carbohydrate was rice starch produces higher ratios between bile acids and cholesterol and between lipid-soluble phosphorus and cholesterol than did the other 2 diets. The average values of the above-mentioned ratios were even slightly lower for the animals in group 3 than for the animals in groups 1 and 2.

4407 ESTERIFICATION REACTION AFFECTING THE PATTERN OF MONOUNSATURATED FATTY ACIDS IN RAT LIVER. *(E.)* Nakagawa, M. (Tohoku U. Sch. Med., Sendai, Japan) and M. Uchiyama. *J Biochem (Tokyo)* 65(4):673-677, 1969.

Desaturation *in vitro* of palmitic acid by a postmitochondrial supernatant of (female, albino, Wistar) rat (weighing 60-120 g) liver homogenates proceeded about 3 times faster than that of stearic acid. When mitochondria and carnitine were added to the system 15 min after the beginning of incubation, palmitoleic acid produced from palmitic acid decreased more rapidly than oleic acid from stearic acid. However, the rate of oxidation of exogenous palmitoleic acid by isolated mitochondria was about the same as that of exogenous oleic acid. Incorporation of oleic acid into esterified lipids by the postmitochondrial supernatant was about 2 times faster than that of palmitoleic acid, and the release of palmitoleic acid from esterified lipids seemed to be more rapid than that of oleic acid. The discrepancy between the efficiency of desaturation of the 2 saturated acids *in vitro* and the ratio of the 2 mono-unsaturated acids found *in vivo* is due to the difference in the rates of incorporation of the 2 unsaturated acids into esterified lipids.

4408 STUDIES ON THE MECHANISM OF PHENOBARBITAL-ENHANCED SULFOBROMOPHTHALEIN DISAPPEARANCE. *(E.)* Klaassen, C. D. (Dept. Pharmacol. Coll. Med., U. Iowa, Iowa City) and G. L. Plaa. *J Pharmacol Exp Ther* 161(2):361-366, 1968.

Rats treated with 75 mg/kg/day phenobarbital for 3 days showed an increased disappearance of BSP. Since BSP undergoes storage, metabolism and excretion by the liver, these parameters were examined to determine which processes were altered by phenobarbital treatment. The rates of disappearance of BSP (100 mg/kg), an equimolar dose (80 mg/kg) of a dibrominated analog of BSP (phenol-3,6-dibromphthalein disulfonate, or indocyanine green (32 mg/kg) were determined. The BSP-glutathione conjugation *in vitro*, hepatic storage and transport maxima, urinary dye excretion (using phenobarbital-treated and control rats), thin-layer chromatography of BSP and its dibrominated analog, and their metabolites, were also determined. An enhanced plasma disappearance was observed for the dibrominated analog of BSP and indocyanine green after phenobarbital treatment. With the BSP analog no significant alteration in hepatic storage was demonstrated, but enhanced biliary transport and bile flow were observed. The enhanced biliary excretion of these dyes after phenobarbital treatment is noteworthy. The role of increased biotransformation is not as important a factor for the increased plasma disappearance of the dyes as might be expected from the effect of phenobarbital on the biological half-life of other substances.

4409 EFFECTS OF ADRENERGIC BLOCKING AGENTS ON EPINEPHRINE– AND $3',5'$-AMP-INDUCED RESPONSES IN THE PERFUSED RAT LIVER. *(E.)* Northrop, G. (U. Wisconsin Med. Sch., Madison). *J Pharmacol Exp Ther* 159(2):22-28, 1968.

Male and female rats (Holtzman strain) were used as the liver and blood donors, resp. The rat liver perfusion technique permitted intraportal infusions of epinephrine or the cyclic nucleotide, $3',5'$-AMP, with and without previous treatment with the alpha- and beta-adrenergic blocking agents, dihydroergotamine and dichloroisoproterenol, followed by the measurement of blood flow rate, blood-glucose and blood-potassium concentrations in the hepatic efferent fluid. The blocking agents were administered into the portal cannula and allowed to recycle 20 min before the addition of the sympathomimetic agents. Blood samples were taken at 5-min intervals during the recycling period. After administration of epinephrine or $3',5'$-AMP into the portal cannula, all blood that passed through the liver was collected into aliquots at intervals of 15 sec for 4 min, followed by aliquots at intervals of 30 sec for 2 min, and by aliquots at intervals of 60 sec for 3 min. Blood samples perfused through the liver of untreated animals served as controls. Epinephrine and $3',5'$-AMP caused hyperglycemia and hypokalemia. Pretreatment with dihydroergotamine prevented these metabolic responses, and pretreatment with dichloroisoproterenol prevented epinephrine-induced metabolic changes. The vasoconstriction induced by epinephrine was blocked by dihydroergotamine but not by dichloroisoproterenol pretreatment. There was no demonstrable change in blood-flow rate after infusion of $3',5'$-AMP.

410 AN INVESTIGATION OF THE DECREASE IN THE METABOLISM OF HEXOBARBITAL, AMINOPYRINE AND p-NITROBENZOIC ACID BY LIVER FROM RATS BEARING A PITUITARY MAMMOTROPIC TUMOR. *(E.)* Wilson, J. T. (Natl. Inst. Hlth., Bethesda, Md.). *Pharmacol Exp Ther* 160(1):179-188, 1968.

The effects of liver cell hypertrophy, adrenalectomy, and cas- ration on the metabolism of hexobarbital and the production f formaldehyde from aminopyrine were studied in liver from ontrol and mammotropic-tumor-bearing male rats. There was o decrease in some liver constituents (dry weight, DNA, or microsomal protein and nitrogen) from tumor-bearing as compared with control animals. A decrease in one or several of hese liver constituents would be expected if liver cell hyper- rophy were present in tumor-bearing rats without a concomi- ant increase in microsomal protein. The metabolism of hexobarbital and the formation of formaldehyde from aminopyrine by the liver were decreased in tumor-bearing rats as compared with controls regardless of the liver constituent used to express his metabolism. Hexobarbital sleeping time was increased in umor-bearing rats. Inhibitors of the *in vitro* hepatic metabolism f hexobarbital and aminopyrine were not found in the liver, erum, or tumor of tumor-bearing rats. The growth of the mammotropic tumor in adrenalectomized and/or castrated male ats produced a decrease in the hepatic metabolism of hexobarbital, aminopyrine, and p-nitrobenzoic acid similar to that ound in the liver from unoperated tumor-bearing animals. The mammotropic tumor hormones (corticotropin, somato- ropin, and prolactin) may decrease the hepatic microsomal metabolism of some compounds by directly acting on the liver *n vivo.*

411 α-FETOPROTEIN IN MONKEYS WITH HEPATOMA. *(E.)* Hull, E. W. (Natl. Cancer nst., Bethesda, Md.), P. P. Carbone, D. Gitlin, R. W. O'Gara and M. G. Kelly. *J Nat Cancer Inst* 42(6):1035-1044, 1969.

Of 42 monkeys treated with N-nitrosodiethylamine (DENA) or at least 1 yr, 23 developed hepatoma. Serum α-fetoprotein (αFP) was found in 20 (87%) of these 23 monkeys, but was not detected in any of the 19 without hepatoma or in any of 75 other monkeys which had not developed hepatoma after reatment with other chemical agents. Liver function tests evealed abnormalities in 78% of the animals with hepatoma and in 36% of the 94 monkeys without hepatoma. In a prospective study, 9 of 14 monkeys developing hepatoma had positive αFP assays either before or at the time hepatic nodules irst became palpable. There was no evident correlation be- ween the appearance of serum αFP and the size or cellular differentiation of the hepatomas. In 4 of 6 monkeys, which were αFP negative at the initial biopsy diagnosis of hepatoma, a heavy lymphocytic infiltration was noted in or around the tumor tissue.

412 BIOCHEMICAL, PATHOLOGICAL, AND GENETIC ASPECTS OF A SPONTANEOUS MOUSE HEPATOMA. *(E.)* Hancock, R. L. (Jackson Lab., Bar Harbor, Me.) and M. M. Dickie. *J Nat Cancer Inst* 43(2): 407-413, 1969.

Transplantable spontaneous hepatomas were found in (DBA/2WyDi x CE/J)F_1 mice fed a high-fat diet. All the male mice had primary hepatomas by 500 days, and 68% had hepatomas at the end of 1 yr. Females had no gross hepatomas at this age, but eventually acquired them. S-adenosyltransferase activity varied markedly among individual mice. Genetic studies showed that DBA/1J, DBA/2J, and C_3H/He hybrids crossed with Ce/J also had a high hepatoma incidence. Chromosome analysis revealed great heterogeneity among individual hepatomas from near normal diploid to hypotetraploid states. Soluble RNA methylase studies did not demonstrate the hypermethylation phenomena sometimes observed with BW7756 hepatoma preparations. A vitamin E effect on hepatoma incidence, induced enzyme studies, and hepatocarcinogenesis are related to fatty liver, sex, and RNA metabolism.

4413 A COMPARISON OF THE PROPERTIES OF PYRUVATE KINASE FROM HEPATOMA 3924-A, NORMAL LIVER AND MUSCLE. *(E.)* Taylor, C. B. (Indiana U. Sch. Med., Indianapolis), H. P. Morris and G. Weber. *Life Sci* 8(12):635-644, 1969.

Pyruvate kinase preparations were made from the livers and muscles of control and tumor-bearing (3924-A hepatomas) ACI/N male rats weighing 100 to 200 g. Muscle pyruvate kinase was stable during overnight dialysis as it was with varying pH. Reduction of pH stabilized the tumor pyruvate kinase which lost 70% of its activity on overnight dialysis and even more when the homogenate supernatant fluid was diluted. The K_m phosphoenolpyruvate (PEP) for tumor pyruvate kinase was 5×10^{-5} M as compared to 6.1×10^{-5} M for muscle pyruvate kinase (M-type) and 7×10^{-4} M for normal liver (L-type). FDP stabilized tumor pyruvate kinase, had no effect on M-type, and was an allosteric effector for the L-type. Electrophoretic migration demonstrated hepatoma enzyme at +12 mm, the M-type at +26 mm, and the L-type at +50 mm. L-alanine inhibition of the tumor and normal liver enzyme was more pronounced with the former and the addition of FDP only partially reversed it for this form of the enzyme. The M-type was unaffected by alanine. K_i values for ATP were tumor 4.5 mM, muscle 17 mM and liver 5.6 mM. The K for PCMB were tumor 2×10^{-7} M, muscle 1.5×10^{-5} M and liver 2×10^{-7} M. The K for tumor enzyme inhibition with cupric ions was 1.5×10^{-5} M, for muscle 10^{-4} M, and for liver 2×10^{-5} M. Potassium, sodium and calcium inhibition was similar for all 3 enzyme forms.

4414 BIOSYNTHESIS OF CHOLESTEROL FROM LONG-CHAIN FATTY ACIDS IN CELL-FREE SYSTEMS FROM LIVER. *(E.)* Foti, L. (Inst. Gen. Physiol. U. Naples, Italy), I. C. Perugini and T. De Leo. *Life Sci* 8(12):607-612, 1969.

In order to verify the hypothesis that long chain fatty acids are first transformed into acetylCoA, via β-oxidation in mitochondria, and then acetylCoA is converted into cholesterol, via mevalonate and squalene in jaloplasm, the action of unlabeled acylCoa, acetylCoA, acetate, malevonate and squalene on the rate of ^{14}C incorporation into cholesterol from ^{14}C stearic or ^{14}C linoleic acid in a rat-liver (male adult Wistar) cell-free system containing mitochondria and the rate of ^{14}C incorporation into cholesterol from the same labeled acids in a cell-free system from the same source deprived of mitochondria was studied. Unlabeled acylCoA, acetylCoA and acetate have no depressing action on the rate of ^{14}C incorporation into cholesterol while malevonate and squalene have a depressing action. The incorporation of labeled stearic and linoleic acids occurs also in a cell-free system deprived of mitochondria.

4415 EFFECT OF SECRETIN ON BILE OSMOLALITY.

(E.) Hardison, W. G. M. (Harvard Med. Sch., Boston, Mass.) and J. C. Norman. *J Lab Clin Med* 73(1):34-41, 1969.

During a series of investigations upon the physiologic action of secretin on bile composition and flow from the perfused pig liver, it was noted that in 7 of 8 experiments, bile osmolality increased with secretin stimulation. This increase implied that the secretin-stimulated fraction of bile was hypertonic to the basal or control fraction of bile. However, the nonideal osmotic behavior of bile salts upon dilution with electrolyte solution could explain the higher osmolality of secretin-stimulated bile. Bile salts above a certain critical micellar concentration (CMC) aggregate to form micelles which are in equilibrium with the monomer at the CMC. Dilution even with a solution that is isosmotic by virtue of another solute causes dissociation of micelles so that the concentration of the monomer is maintained constant at a concentration equal to the CMC. This results in more osmotically active particles than predicted from simple linear dilution of an ideal solution. This theory was tested by mixing solutions of bile salt (sodium cholate or taurocholate) and of pig bile with pure electrolyte solutions of approximately equal osmolality. The resultant osmolality was always greater than that predicted from ideal behavior. Control bile samples from a perfused pig liver were mixed with an artificial electrolyte solution made to approximate the calculated secretin fraction from the same liver. The increase in osmolality with mixing was similar to that observed in bile collected from the liver during secretin stimulation.

4416 ALIMENTARY PRODUCTION OF GALLSTONES IN HAMSTERS. 21. THE CONTENT OF CHOLESTEROL IN LIVERS OF HAMSTERS REARED ON DIETS WITH DIFFERENT INFLUENCE ON GALLSTONE FORMATION.

(E.) Prange, I. (Polytechnic Inst., Copenhagen, Denmark), F. Christensen and H. Dam. *Z Ernaehrungswiss* 9(2-3):118-122, 1969.

Esterified and unesterified cholesterol determinations were made of livers of young female hamsters reared for 56-58 days on 3 different diets: 1) a cholesterol-gallstone producing diet containing no added fat and having glucose as the major carbohydrate; 2) a diet also containing no added fat but having rice starch as the only carbohydrate (a type of diet with a low tendency of gallstone production) and 3) a diet containing 10% lard and no sugar (a diet found capable of dissolving formed cholesterol gallstones). Compared with the animals on diets 1 and 2, the animals on diet 3 had lower content of esterified and unesterified cholesterol per g liver. No significant difference could be found between the animals on diet 1 and the animals on diet 2 with respect to the content of unesterified cholesterol per g liver. The amount of esterified cholesterol per g liver was somewhat higher for the animals on diet 2 than for the animals on diet 1, but the difference was of slight significance. The marked difference between diet 1 and diet 2 with respect to gallstone production is not dependent on differences in cholesterol content of the liver.

4417 NUCLEOSIDEDIPHOSPHATASE ACTIVITY IN PLASMA MEMBRANE OF RAT LIVER.

(E.) Wattiaux-de Coninck, S. (Lab. Physiol. Chem., Fac. U. Notre-Dame de la Paix, Namur, Belgium) and R. Wattiaux. *Biochim Biophys Acta* 183(1):118-128, 1969.

The results of experimental work using Wistar rat livers strongly suggest that a nucleosidediphosphatase is effectively associated with the plasma membrane—it can be tested with ADP as a substrate, and is not activated by deoxycholate. The results also show that another nucleosidediphosphatase is present in endoplasmic-reticulum membranes and that this enzyme can be teste with IDP in the presence of deoxycholate. After differential centrifugation in 0.25 M Sucrose, the distribution and behavior of the enzyme acting on IDP is similar to that of glucose-6-phosphatase; and ADPase distribution and behavior is comparable to that of 5′-AMPase. In purified plasma membrane preparations, ADPase and 5′-AMPase show a specific activity about 25 times higher than that found in the homogenate, while IDPase is only 5 times higher.

4418 THE INTRACELLULAR POTENTIAL OF REGENERATING LIVER.

(E.) Humphrey, E. W. (Dept. Surg., Minneapolis VA Hosp. and U. Minnesota) and T. Maeno. *Biochim Biophys Acta* 183(1):236-238, 1969.

The membrane potential of normal Sprague-Dawley rat liver parenchymal cells was compared with that of regenerating liver 48 hr after a subtotal hepatectomy. The cells were impaled with glass capillary micro-electrodes filled with 3 M KCl, the electrodes were connected to a conventional cathode follower preamplifier through an Ag-AgCl electrode. A parallel series of experiments was done in which a tracer amount of radioiodinated serum albumin was added to the incubation fluid as an indicator of the extracellular fluid volume. Only at 15C (measured also at 35C) was there a significant difference between the median membrane potential of normal liver cells and of regenerating liver cells. The bound potassium was a linear function of the total in spite of the difference in tissue and in incubation conditions. The measured potential difference is from 0.28 to 0.36 that of the calculated potassium potential difference. (The procedure used possibly allows some nonspecific shunting.) The results seem to rule out increased potassium complexing as the sole cause of the previously reported increase in intracellular potassium in a growing tissue, although it does not exclude an increase due to the Donnan effect. The permeability characteristics of the cell membrane of nonexcitable tissues can change. A decrease in permeability is associated with both normal and abnormal growth. It is not clear whether the control of cell growth is mediated through the permeability characteristics of the membrane, or whether th changed permeability is a secondary consequence of growth.

4419 THE ROLE OF THE LIVER IN THE METABOLISM OF VITAMIN D.

(E.) Ponchon, D. (Dept. Biochem., U. Wisconsin, Madison) and H. F. De Luca. *J Clin Invest* 48(7):1273-1279, 1969.

The metabolism of vitamin D_3 has been studied after i.v. injection of 10 IU of (1,2-^{3}H)-vitamin D_3 to vitamin D-deficient male, Holtzman, weanling rats (average weight 230 g). The disappearance of radioactivity from plasma showed a peculiar pattern characterized by an early rapid disappearance during

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30 min, a rebound of radioactivity from 30 min to 8 hr and then a rather slow disappearance rate to 3 weeks. The "rebound" phenomenon is concomitant with a rapid release of radioactivity from the liver and is accounted for by the appearance of 25-hydroxycholecalciferol and other metabolites in the blood. The liver may be the major site of transformation of vitamin D_3 into 25-hydroxycholecalciferol.

4420 **EFFECT OF HEPARIN ON THE INACTIVATION OF SERUM LIPOPROTEIN LIPASE BY THE LIVER IN UNANESTHETIZED DOGS.** *(E.)* Whayne, T. F. Jr. (U. California Med. Ctr., San Francisco), J. M. Felts and P. A. Harris. *J Clin Invest* 48(7):1246-1251, 1969.

Lipoprotein lipase (LPL) inactivation by the liver was studied in catheterized, unanesthetized, male mongrel dogs (weighing 15 to 25 kg) by measuring portal vein-hepatic vein differences in levels of the enzyme. The extraction ratios (portal vein-hepatic vein difference) in 2 dogs following the intraarterial infusion of post-heparin serum from a donor dog were 68% and 42%. LPL activity in the portal vein was 39% higher than in arterial samples obtained from the first dog and was 4% greater in the second. The LPL extraction ratio in a dog given heparin (20 U/kg) intraarterially was 40%. Portal vein LPL activity was 14% greater than arterial LPL activity. At a higher (200 U/kg) level of intraarterial heparin the extraction ratios in 2 dogs were 10 and 4.7%. The injection of protamine (1 mg/mg heparin) caused a marked drop in LPL activity from all sampling sites. The LPL activity in arterial samples before and after protamine was almost identical with portal vein activity. There was an apparent restoration of LPL activity upon passage through the liver. The LPL activity in arterial samples was almost identical with samples from the portal vein. Increasing the amount of heparin in serum obtained from a heparinized dog failed to increase its LPL activity.

4421 **SOME FACTORS AFFECTING CARBOHYDRATE METABOLISM IN HEPATIC TISSUES OF DIFFERENT GROWTH RATES.** *(E.)* Lea, M. A. (New Jersey Coll. Med. & Dent., Jersey City), D. Sasovetz and H. P. Morris. *Int J Cancer* 4(4):487-494, 1969.

Aspects of carbohydrate metabolism, such as glycogen concentration, glucokinase and hexokinase activity, lactate and α-glycerophosphate production, were compared with growth rate in Sprague-Dawley male rat regenerating liver and 2 hepatomas (5123-D and 7777) transplanted in Buffalo strain rats. Lactate production with glucose as substrate was greater with whole homogenates than with supernatant fractions for the hepatomas but the reverse was the case with control, sham-operated and regenerating liver. Nicotinamide had a greater effect on lactate production by homogenates of normal and regenerating liver than with tumor homogenates. The effect of nicotinamide was correlated with the NAD glycohydrolase activity of homogenates and supernatant fractions of the different tissues. Changes in carbohydrate metabolism in regenerating liver show some resemblance to those observed in hepatomas of similar growth rate but more marked changes may be seen in the tumor tissues.

4422 **AMPICILLIN LEVELS IN HUMAN BILE IN THE PRESENCE OF BILIARY TRACT DISEASE.** *(E.)* Mortimer, P. R. (Middlesex Hosp. Med. Sch., London, England), D. B. Mackie and S. Haynes. *Brit Med J* 3(5662): 88-89, 1969.

Ampicillin levels in the serum and in the bile from both the gallbladder and the common bile duct were measured in 23 patients undergoing surgery for biliary tract diseases (cholelithiasis and normal liver function tests without obstruction 11 patients, blocked cystic duct, without obstruction of the common bile duct or liver damage, 6, obstructive jaundice, 6). In patients with radiologically nonfunctioning gallbladders ampicillin was either not present or its concentration was lower than normal. Therapeutic levels were present in the common bile duct of all patients except those with obstruction of the common bile duct. Ampicillin failed to penetrate the obstructed viscus in obstructive biliary tract disease and it is likely to be ineffective in treating infections associated with this.

4423 **LYSOSOMAL ENZYMES IN REGENERATING RAT LIVER.** *(E.)* Klockars, M. (U. Helsinki, Finland) and O. Wegelius. *Proc Soc Exp Biol Med* 131(1): 218-222, 1969.

The concentration of the lysosomals enzymes acid phosphatase, arylsulfatase B, and β-glucuronidase, was determined in regenerating liver 1, 2, 3, and 10 days after partial hepatectomy in Sprague-Dawley rats weighing 200-300 g. The maximal increase for acid phosphatase and β-glucuronidase activity occurred after 1 day and amounted to 29 and 87%, resp. The maximum specific activity for arylsulfatase was 194% of normal liver and occurred after 2 days. All three enzyme levels returned to their initial levels in 3 days and remained there. It is suggested that the lysosomes play a role in postmitotic autophagocytosis and are involved in the inhibition of liver regeneration rather than in the initiation of the process of cell division.

4424 **ORGAN SPECIFIC EFFECT OF THIOACETAMIDE ON LIVER GLYCOGEN.** *(E.)* Sapre, N. N. (Cancer Res. Inst., Tata Mem. Ctr., Parel, Bombay, India), S. V. Gothoskar and S. V. Bhide. *Indian J Exp Biol* 7(1):4-7, 1969.

The metabolic effects of thioacetamide, an hepatocarcinogen which causes marked enlargement of hepatic nuclei and nucleoli, were studied on male Swiss mice. Intraperitoneal injection of thioacetamide (250 mg/kg body weight) significantly decreased the glycogen and protein levels of the liver, while total RNA and DNA contents of hepatic tissue remained the same by histochemical evaluation. Simultaneously with the decrease in glycogen and protein, the activities of glucose-6-phosphatase, fructose-1,6-diphosphatase and phosphoglucomutase also diminished on thioacetamide administration. Thioacetamide was found to affect only liver glycogen and not that of kidney and muscle.

4425 **BILE CANALICULUS AND SPACE OF DISSE: ELECTRON MICROSCOPIC RELATIONSHIPS AS DELINEATED BY LANTHANUM.** *(E.)* Schatzki, P. F. (M. D. Anderson Hosp. & Tumor Inst., U. Texas, Houston). *Lab Invest* 20(1):87-93, 1969.

Sprague-Dawley rats (42); normal, and with experimental biliary obstruction were used to study passage through the tight junction–an area of approximation of liver cell membranes. Liver tissue was fixed using lanthanum as contrast material. Some animals were injected with lanthanum via the common bile duct or portal vein in an attempt to show passage across the tight junction. Livers fixed in the presence of lanthanum showed interspaces between liver cells and spaces of Disse filled with lanthanum. Occasional deposits of lanthanum were found in bile canaliculi, but tight junctions appeared well preserved, and no lanthanum appeared within them. Tissues from animals injected with lanthanum showed lanthanum deposits in cell interspaces, spaces of Disse, and canaliculi. Lanthanum penetration through the tight junction was suggested occasionally. Lanthanum passes across tight junctions under conditions of increased pressure from the bile canaliculus to the interspace or in the opposite direction.

4426 DRUG METABOLISM IN HYPOTHERMIA. UPTAKE, METABOLISM AND EXCRETION OF S^{35}-SULFANILAMIDE BY THE ISOLATED, PERFUSED RAT LIVER. *(E.)* Kalser, S. C. (Sch. Med., U. Pittsburgh, Pa.), E. J. Kelvington and M. M. Randolph. *J Pharmacol Exp Ther* 159(2):389-398, 1968.

^{35}S-sulfanilamide was chosen to study the sensitivity of various drug metabolic processes to lowered temperatures because its conjugation process, an N-4 acetylation, is a single biotransformation in the rat. Also, sulfanilamide has been extensively studied under euthermic conditions. Since hypothermia in the intact animal causes many complex changes in respiration, circulation and metabolism, the isolated perfused rat-liver preparation was used because it is a fully-organized and functionally-important unit of drug metabolism. Sulfanilamide is metabolized mainly by the liver. Its uptake by the liver was low, proportional to organ size, and unaffected by decreased temperatures (37, 25, and 17C). The liver can acetylate sulfanilamide even at temperatures of 15C but the rate decreases as the temperature decreases. Most of the acetylated compound appears in the blood. The rate of appearance follows an exponential curve with half-times of 70 min at 37C to 750 min at 15C. The maximum concentration of sulfanilamide in the bile was the same at all temperatures studied, but the maximum was reached more slowly at lower temperatures. There was no evidence that active transport of sulfanilamide from blood into bile occurs in the isolated rat-liver preparation. The total quantity of drug excreted in the bile in the immediate postinjection period was primarily in the free form.

4427 THE EFFECT OF AGE ON THE HEPATIC REGENERATIVE PROCESS AFTER SUBTOTAL HEPATECTOMY IN THE RAT. *(It.)* Pietranera, P. (Inst. Semeiotica Med., U. Parma, Italy), M. Tonelli, G. Bazzicalupo and M. Passeri. *Riv Gastroent* 20(3):171-177, 1968.

Male rats were divided into 2 groups of 42 each: 1 group weighing 200-230 g and about 50 days old and the other weighing more than 500 g and aged between 12 and 15 months. About 64% of the total liver mass was surgically removed and the animals were sacrificed after 28, 32, 36, 40, 46, and 50 hr. After sacrifice, the residual liver was removed and studied histologically. At 28 hr after surgery the old rats showed 1.8% of the liver cells in mitosis, while the young rats had 10.3% of the cells in mitosis. At 40 hr, a peak was reached in the old rats (6.3%), at which time the young rats had 30.9% of the cells in mitosis. Similar differences were observed throughout the study. Apparently with aging the possibility of rat liver regeneration becomes increasingly limited

4428 PIG-TO-BABOON LIVER XENOGRAFTS. *(E.)* Calne, R. Y. (Addenbrooke's Hosp., Cambridge, England), H. J. O. White, B. M. Herbertson, P. R. Millard, D. R. Davis, J. R. Salaman and J. R. Samuel. *Lancet* 1(7553): 1176-1178, 1968.

Seven piglets (10 kg) were used as liver donors to recipient baboons. The xenografted liver assumed a paler pink color than porcine liver allografts, but all animals awoke from anesthesia, indicating initial liver function, and bile was secreted at the time of operation. All animals were given ϵ-aminocaproic acid, but severe hemorrhage caused the death of 4 in 6-30 hr. The other 3 animals were given human fibrinogen and did not suffer from bleeding: 2 died from liver failure at 19 and 36 hr; the last animal died from bronchopneumonia after 3½ days. Steroids and azathiopyrine were given to 2 animals and steroids alone to 2 others, including the longest survivor. The 4 animals living 19 or more hr were active, alert, ate fruit, and drank water on the day after operation. Deterioration leading to coma and death was rapid. At necropsy the first 6 xenografted livers had patchy centrilobular hepatic necrosis. The liver of the 3½ day survivor had well preserved hepatocytes and mononuclear cellular infiltration of the portal tracts. The centrilobular necrosis could be due to poor early perfusion of the liver and may have been responsible for the hemorrhagic state in 4 animals and liver failure in 2 others.

4429 CHANGES IN ZINC METABOLISM IN CIRRHOSIS OF THE LIVER WITH AND WITHOUT ENCEPHALOPATHY. *(Sp.)* Santiago Corchado, M. (La Paz Clin. Social Security, Madrid, Spain), B. Ribas Ozonas, A. Santos Ruiz and J. Ortiz Vázquez. *Rev Clin Esp* 110(2):109-114, 1968.

Zinc metabolism was studied in 15 healthy subjects and 40 patients (32 cirrhosis of the liver and 8 other liver diseases). Zinc excreted in the urine was higher in patients with cirrhosis of the liver than in healthy subjects. Of the 18 cirrhosis patients, 8 showed a decrease in serum zinc; in the remaining 10 the decrease was not significant. In the majority of the cases zinc content in the urine was higher than in the serum. In 14 cases the ratio of serum to urine zinc was between 0.2 and 1. Parallelism between the degree of liver pathology and the rate of zinc elimination demonstrated by the sulfobromophthalein retention test and by determining prothrombin activity. A marked decrease in serum zinc and increase in urine zinc was found in 2 acute hepatitis patients. No changes in either serum or urine zinc content was found in 4 chronic hepatitis patients and in 2 patients with liver stasis. In 10 of the 14 cirrhosis patients in hepatic coma there was a marked increase in zinc excretion and a marked decrease of serum zinc.

4430 ACTION OF THE ASCORBIC ACID ON THE AMMONEMIA, α-KETOGLUTARIC ACID,

**LUTAMIC ACID AND GLUTAMINE IN CIRRHOTIC AND
ORMAL SUBJECTS.** *(Fr.)* Schirardin, H. (Lab. Gen. Pathol.,
rasbourg, France), M. Bauer and J. Warter. *C R Soc Biol*
51(10):2060-2064, 1968.

cirrhotic and normal subjects, injected i.v. with 1 g of as-
rbic acid, blood ammonemia, plasma α-ketoglutaric acid and
utaric acid, and blood glutamine were determined. In cirrhotic
d normal subjects, resp., blood ammonemia decreased 23%
d 28% 1 hr after the stimulus; 24% and 28% after 2 hr;
% and 22% after 3 hr. Plasma α-ketoglutaric acid decreased
% and 15% after 1 hr; 14% and 46% after 2 hr; 15% and 38%
er 3 hr. Plasma glutamic acid decreased 22% and 47% after
ır; 14% and 58% after 2 hr; 15% and 29% after 3 hr. Blood
tamine increased 15% and 23% after 1 hr; 17% and 28% after
ır; decreased slowly to normal values and increased 25% after
ır.

31 **ABNORMAL PRESENCE OF ISOENZYMES OF
LACTIC DEHYDROGENASE IN THE EXPERI-
NTAL HEPATOMA.** *(Fr.)* Schapira, F. (Inst. Res. Cancer,
lejuif, France) and B. de Nechaud. *C R Soc Biol* 162(1):
89, 1968.

e isoenzymes of LDH were studied in adult rat liver, in
l liver, and in an experimental hepatoma. The hepatoma
s induced in 6 week old Wistar rats by dimethyl methylamino
benzene. Results showed in the normal adult rat liver the
dominance of isoenzyme 5 (A_4 subunits) and isoenzyme 4
; B_1 subunits) and complete absence of isoenzyme 1 (B_4
units). In hepatoma 2 anomalies were found: 1) the pres-
e of supplementary bands moving like isoenzymes in the
scles of the rat, and corresponding to isoenzyme 3 (A_2 B_2
units) and 2 (A_1 B_3 subunits): 2) the presence of an ab-
mal band moving between isoenzymes 4 and 3. This ab-
mal band, associated with an increase in isoenzymes 3 and
vas also observed in fetal liver.

2 **EFFECTS OF CARBON TETRACHLORIDE
INTOXICATION ON BILIARY EXCRETION
THE RAT.** *(Fr.)* Vanlerenberghe, J. (Fac. Med. Pharm.,
e, France), C. Lejeune-Lecocq, C. Bel, R. Cassaigne and L.
nis. *Lille Med* 13(4):398-407, 1968.

e Wistar rats were given 1 or 2 ml/kg carbon tetrachloride
or p.o. at intervals after 3 hr and 7 days, the animals were
thetized and the bile was collected. The rate of biliary ex-
ion was not modified in the first 20 hr, and only a slight
ction was observed after 45 hr in the animals injected s.c.
earlier and more marked reduction was observed when the
t was given p.o. After 24 hr biliary bilirubin increased
n it was given p.o. at 2 ml/kg. In all the intoxicated rats,
ride, sodium and potassium ions in the bile were unchanged.
BSP excretion test was normal, but Neutral Red excretion
reduced by about 50%. Histologic examination of the liver
6 hr demonstrated centrolobular congestion, with slight
phoplasmocytic infiltration; after 8 hr the presence of lipidic
ovacuolar pericentrolobular cells; after 48 hr an increase
ecrotic phenomena.

3 **THE BEHAVIOR OF FREE AND MEMBRANE-
BOUND RAT LIVER RIBOSOMES FOLLOWING
ERIMENTAL DAMAGE WITH CCl_4.** *(Ger.)* Michel, S. (Physiol. Chem. Inst. Friedrich-Schiller U., Jena, Germany), G. Richter, M. Tschisgale and B. Brux. *Acta Biol Med German* 21(5):603-614, 1968.

The distribution of free and membrane-bound ribosomes in normal rat liver and 30 min to 48 hr after i.p. injection of 0.2-0.3 ml CCl_4/100 g body weight was studied. In normal rat liver 2/3 of all ribosomes are bound to membranes; the remaining exist in a free form. Both free and membrane-bound ribosomes are organized in polysomes. Free monomers, if present at all, amount to less than 5% of the free ribosomes. After CCl_4 administration, free polysomes are very rapidly destroyed. Twelve to 18 hr after CCl_4 injection, polysomes reappear early in the process of regeneration during which the sedimentation constants of free polysomes shift from low to high values. After 4 hr the destruction of membrane-bound ribosomes begins; their regeneration is much slower than that of free ribosomes and is scarcely detectable even after 48 hr.

4434 **AN EXPERIMENTAL STUDY ON ALTERATIONS IN SERUM FATTY ACID IN VARIOUS HEPATIC LESIONS.** *(Jap.)* Sasaki, E. (Gifu U. Sch. Med., Japan). *Acta Sch Med Univ Gifu* 15(3):735-764, 1968.

Changes in serum fatty acids in dogs with various hepatic lesions were evaluated with gas-liquid chromatography. In a dog with ligation of the hepatic artery given penicillin there were minimal changes in the fatty acid composition ratio and the total amount of fatty acid, but the palmitic:linoleic ratio (P/L) was significantly increased and reached a maximum on the 4th postoperative day. There was a marked decrease in linoleic acid with a 50% decrease from original values observed on the 2nd postoperative day. In a dog with Eck's fistula there were no significant changes in the total amount of fatty acid or the composition ratio, but the linoleic:oleic ratio (L/O) decreased during the period of observation (markedly on the 2nd postoperative day). In the dog with an ischemic liver oleic acid was markedly increased (37% above base values within 3 hr) and there was a decrease in L/O. In the totally hepatectomized dog linoleic acid was increased 29% and oleic acid 23% in 9 hr postoperatively. An increase in P/L and a decrease in L/O were observed. Linoleic and arachidonic acid values declined 50 and 55%, resp., 9 hr postoperatively. Dogs without liver or with ischemic liver were treated with cross circulation to correct the metabolic disorders; however the increase in P/L and the decrease in L/O were not corrected. A marked decrease in linoleic acid was observed after cross circulation not only in the dogs with hepatic lesions but also in normal dogs. A marked decrease in arachidonic acid was seen in both hepatectomized and normal dogs.

4435 **EVIDENCE FOR BINDING OF ROSE BENGAL AND ANILINONAPHTHALENESULFONATES AT THE ACTIVE SITE REGIONS OF LIVER ALCOHOL DEHYDROGENASE.** *(E.)* Brand, L. (Dept. Biol., Johns Hopkins U., Baltimore, Md.), J. R. Golhlke and D. S. Rao. *Biochemistry* 6(11):3510-3518, 1967.

4436 **THE CITRATE CLEAVAGE ENZYME ACTIVITY IN CHICK EMBRYO AND CHICKEN LIVER DURING DEVELOPMENT.** *(E.)* Felicioli, R. A.

(Inst. Biol. Chem., U. Pisa, Italy) and F. Gabrielli. *Experientia* 23(12):1000-1001, 1967.

4437 **sRNA METHYLASE ACTIVITY OF EMBRYONIC LIVER.** *(E.)* Hancock, R. L. (Jackson Lab., Bar Harbor, Me.), P. McFarland and R. R. Fox. *Experientia* 23(10):806-807, 1967.

4438 **A QUANTITATIVE METHOD OF MEASURING LIVER REGENERATION IN THE DOG.** *(E.)* Baker, R. R. (Johns Hopkins U. Sch. Med., Baotimore, Md.), T. Migita and H. N. Wagner Jr. *J Surg Res* 7(12):578-582, 1967.

4439 **INTRACELLULAR DISTRIBUTION OF COPPER IN THE LIVER OF THE RAT.** *(E.)* Gregoriadis, G. (McGill U., Montreal, Quebec, Canada) and T. L. Sourkes. *Canad J Biochem* 45(7):1841-1851, 1967.

4440 **ISOENZYMES OF ALKALINE PHOSPHATASE IN THE SOLUBLE PHASE OF RAT LIVER CELLS.** *(Ger.)* Kaschnitz, R. (Inst. Gen. Exp. Pathol., U. Vienna, Austria), J. Patsch and M. Peterlik. *Europ J Biochem* 5(1):51-54, 1968.

4441 **THE EFFECT OF N-DIAZOACETYLGLYCINE HYDRAZIDE ON HEPATIC REGENERATION AND EMBRYONIC DEVELOPMENT IN THE RAT.** *(It.)* Baldini, L. (Inst. Pharmacol., U. Genoa, Italy), G. Brambilla, M. Cavanna and S. Parodi. *Boll Soc Ital Biol Sper* 44(5): 437-441, 1968.

4442 **CORRELATIONS BETWEEN THE PINEAL GLAND AND LIVER AND BLOOD CHOLESTEROL IN MICE AND RATS.** *(Rum.)* Milcu, I. (Inst. Endocrinol., Acad. Romanian Socialist Republic, Bucharest), E. Damian, I. Popescu and O. Ianas. *Stud Cercet Endocr* 19(6):473-478, 1968.

4443 **INCREASE IN GLUCOSE AND DECREASE IN FREE FATTY ACIDS IN THE PERFUSATE FROM ISOLATED MOUSE LIVERS IN THE PRESENCE OF PROLACTIN FROM SHEEP.** *(Rum.)* Costiner, E. (Inst. Endocrinol., Acad. Romanian Socialist Republic, Bucharest), L. Vaisler, L. Simionescu and E. Dinulescu. *Stud Cercet Endocr* 19(6):487-492, 1968.

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4446 ***IN VIVO* DEPHOSPHORYLATION OF *L*-^{14}C GLUCOSAMINE-6-PHOSPHATE IN RAT LIVER. NOTE VI.** *(It.)* Tesoriere, G. (Inst. Chem. Biol., U. Palermo, Italy), R. Vento, C. Nicotra and S. Macaione. *Boll Soc Ital Biol Sper* 44(21):1789-1791, 1968.

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4450 **REGULATION OF RAT LIVER GUANINE AMINO HYDROLASE BY GTP.** *(E.)* Josan, V. (Dept. Biochem., Lucknow U., India) and P. S. Krishnan. *Biochem Biophys Res Commun* 31(3):299-302, 1968.

4451 **SYNTHESIS OF THE PLASMA MEMBRANE OF THE LIVER CELL.** *(E.)* Ray, T. K. (U. Pittsburgh Sch. Med., Pa.), I. Lieberman and A. I. Lansing. *Biochem Biophys Res Commun* 31(1):54-58, 1968.

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4454 **THE EFFECTS OF STARVATION AND ALLOXAN-DIABETES ON THE CONTENTS OF CITRATE AND OTHER METABOLIC INTERMEDIATE IN RAT LIVER.** *(E.)* Start, C. (Dept. Zool., U. Oxford, England) and E. A. Newsholme. *Biochem J* 107(3):411-415, 1968.

4455 **ETHIONINE INDUCED sRNA NEOMETHYLA ACTIVITY.** *(E.)* Hancock, R. L. (Jackson La Bar Harbor, Maine). *Biochem Biophys Res Commun* 31(1): 77-81, 1968.

4456 **THE SYNTHESIS OF SERUM PROTEINS ON ATTACHED RATHER THAN FREE RIBOSOMES OF RAT LIVER.** *(E.)* Redman, C. M. (New York Blood Ctr., N. Y.). *Biochem Biophys Res Commun* 31(6): 845-850, 1968.

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4458 **HISTOCHEMICAL AND BIOMETRIC INDICATORS OF THE STATE OF INTACT AND REGENERATED LIVER IN PREGNANT RATS.** *(Rus.)* Kovalenko, N. Ya. (Acad. Med. Sci., Moscow, USSR). *Eksp Khir Anest* 13(1):5-9, 1968.

4459 **THE MECHANISMS OF BILIARY SECRETION.** *(Fr.)* Erlinger, S. *Rev Int Hepat* 18(1):1-39, 1968.

4460 **THE EFFECT OF PITRESSIN ON INTRAHEPATIC PORTAL PRESSURE IN THE ISOLATED LIVER.** *(Fr.)* Lambilliotte, J. P. (Harvard Med. Sch., Cambridge, Mass.) and J. C. Norman. *Rev Franc Etud Clin Biol* 13(3):289-292, 1968.

4461 **EXPERIMENTAL MODEL FOR THE STUDY OF THE ENTEROHEPATIC CIRCULATION OF BILE IN RHESUS MONKEYS.** *(E.)* Dowling, R. H. (Boston U. Sch. Med., Mass.), E. Mack, J. Picott, J. Berger and D. M. Small. *J Lab Clin Med* 72(1):169-176, 1968.

4462 **EFFECTS OF INDUCER SUBSTANCES ON PORPHYRIN SYNTHESIS IN LIVER CELL CULTURES.** *(E.)* Doss, M. (Inst. Hyg., Philipps U., Germany). *FEBS Letters* 2(2):127-129, 1968.

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464 **EXPERIMENTAL STUDY OF THE CHOLERETIC ACTIVITY OF 2′-HYDROXY-5′-CARBOXY-1-HENYLPENTANOL-1.** *(Fr.)* van den Driessche, J. ("La einais", Betton, France), A. Binet, E. Eben-Moussi and P. llain. *Therapie* 23(2):329-340, 1968.

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4468 **THE EFFECT OF VITAMIN B_{12} ON HEPATIC METABOLISM IN THE RAT.** *(Rum.)* Crăciun, O. (Dept. Biol. Hist., U. Cluj, Romania) and V. Preda. *Clujul Med* 41(1):117-120, 1968.

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4471 **ALTERNATE TRIOSE PHOSPHATE PATHWAYS FOR GLYCERIDE BIOSYNTHESIS IN RAT LIVER.** *(E.)* Rao, G. A. (Dept. Biochem., Texas A & M U., College Station), M. F. Sorrels and R. Reiser. *Biochem Biophys Res Commun* 31(2):252-256, 1968.

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4474 **OCCURRENCE OF 7-METHYLGUANINE IN NUCLEIC ACIDS OF RAT LIVER.** *(E.)* Craddock, V. M. (Med. Res. Counc. Lab., Carshalton, England), S. Villa-Trevino and P. N. Magee. *Biochem J* 107(2):179-184, 1968.

4475 **HEPATIC SYNTHESIS OF HAPTOGLOBIN: EXPERIMENTAL STUDIES IN THE RAT.** *(Fr.)* Lombart, C. (Fac. Med., U. Paris, France), M. Nebut, M. P. Ollier, M. F. Jayle and L. Hartmann. *Rev Franc Etud Clin Biol* 13(3):258-266, 1968.

4476 **QUANTITATIVE INVESTIGATION OF THE BROMSULPHTHALEIN KINETICS BY MEANS OF THE UPTAKE OF THE DYE BY ISOLATED LIVER CELLS. I. METHOD.** *(Cz.)* Skaunic, V. (Med. Fac., Charles U., Hradec Králové, Czechoslovakia) and V. Nerad. *Cesk Gastroent Vyz* 23(3):105-109, 1969.

4477 **EFFECT OF CITRATE ON ACYL-CoA SYNTHETASE OF RAT LIVER.** *(Jap.)* Harada, T. (Tokushima U. Sch. Med., Japan). *Shikoku Acta Med* 25(1): 219-228, 1969.

SECRETION AND METABOLISM

4478 CONTROL OF FATTY ACID SYNTHESIS IN HOMOGENATE PREPARATIONS OF MOUSE HEPATOMA BW 7756. *(E.)* Sabine, J. R. (Dept. Physiol.-Anat., U. California, Berkeley) and I. L. Chaikoff. *Aust J Exp Biol Med Sci* 45(5):541-548, 1967.

4479 THE SECRETION OF BILE. *(Rev.)(E.)* Brooks, F. P. (Hosp. U. Pennsylvania, Philadelphia). *Amer J Dig Dis* 14(5):343-349, 1969.

4480 THE PATTERN OF RECOVERY OF ERYTHROPOIESIS IN HEAVILY IRRADIATED MICE RECEIVING TRANSPLANTS OF FETAL LIVER. *(E.)* Kubanek, B. (Tufts U. Sch. Med., Boston, Mass.), N. Rencricca A. Porcellini, D. Howard and F. Stohlman Jr. *Proc Soc Exp Biol Med* 131(3):831-834, 1969.

4481 THE METABOLISM OF TOLBUTAMIDE IN RAT LIVER. *(E.)* McDaniel, H. G. (Dept. Med. Physiol. Pharmacol., Duke U., Durham, N. C.), H. Podgainy an R. Bressler. *J Pharmacol Exp Ther* 167(1):91-97, 1969.

4482 CARBOHYDRATE METABOLISM IN THE STUDY OF LIVER FUNCTION. *(It.)* Bianco, C. (S. G. B. Cottolengo Hosp., Turin, Italy), R. Bonsi and G. Papotti. *Arch Sci Med (Torino)* 124(4):411-422, 1967.

See also: 4277,4291,4293,4299,4304,4321,4868,4935

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4483 **INTERACTIONS BETWEEN LEUCINE AND LYSINE TRANSPORT IN RABBIT ILEUM.** *(E.)* Munck, B. G. (U. Pittsburgh Sch. Med., Pa.) and S. G. Schultz. *Biochim Biophys Acta* 183(1):182-193, 1969.

The results of this study of the interaction between leucine and lysine transport across short-circuited segments of isolated New Zealand rabbit ileum indicate that the presence of 2 mM leucine in the mucosal solution markedly stimulates the rate of net lysine transport. This stimulatory effect is due entirely to an increase in the unidirectional flux of lysine from mucosa to serosa and the flux from serosa to mucosa is unaffected by leucine. High concentrations of lysine inhibit leucine transport across the brush border, and high concentrations of leucine similarly inhibit lysine transport; suggesting that the processes mediating the transport of these 2 amino acids across the brush border have overlapping specificities. The results suggest a direct noncompetitive interaction between leucine and a carrier mechanism responsible for lysine movement across the serosal boundary of the epithelium. Preloading the intestinal tissue with leucine alone markedly enhances the unidirectional influx of lysine from the mucosal solution across the brush border. Since preloading with lysine has no effect on lysine influx and preloading with leucine has no effect on leucine influx, this phenomenon appears to be another indication of an effect of leucine on the lysine transport mechanism.

4484 **EFFECT OF ENDOGENOUS ACIDIFICATION OF THE DUODENUM ON THE HEIDENHAIN POUCH PEPSIN RESPONSE TO HISTAMINE.** *(E.)* Saik, R. P. (U. Pennsylvania Sch. Med., Philadelphia), E. M. Copeland, L. O. Miller and G. P. Smith. *Ann Surg* 170(2): 244-248, 1969.

Acid and pepsin output from Heidenhain pouches in 5 mongrel dogs (weighing 19 to 25 kg) also provided with gastric fistulas, stimulated by a constant submaximal (for acid) i.v. histamine dose, were studied. Duodenal acidification, achieved by closing a gastric fistula and presumably releasing endogenous secretin, was associated with a large rise in pepsin output in all dogs without any corresponding change in acid output. Opening the fistula was associated with a decreased pepsin output in a majority of the cases as well as an increase in acid output.

4485 **PROTEIN STARVATION AND THE SMALL INTESTINE. III. INCORPORATION OF ORALLY AND INTRAPERITONEALLY ADMINISTERED *l*-LEUCINE 4,5-^{3}H INTO INTESTINAL MUCOSAL PROTEIN OF PROTEIN-DEPRIVED RATS.** *(E.)* Hirschfield, J. S. (U. Colorado Med. Ctr., Denver) and F. Kern Jr. *J Clin Invest* 48(7):1224-1229, 1969.

Weanling albino, Holtzman rats (mean weight 50 g) were fed diets which contained either no protein or 27% protein. In 1 experiment after 23-35 days both groups were given *l*-leucine-4,5-^{3}H either intragastrically or i.p. and sacrificed in 24 hr. In a second experiment animals were given the diets for 21 days and sacrificed, 3,6, or 12 hr after either intragastric or i.p. administration of the labeled leucine. In both experiments the intestinal mucosa of proximal and distal segments of the small intestine was scraped, weighed, the protein concentration measured, and the specific activity of the mucosal protein determined. The wet weight of the mucosa and the protein concentration of the mucosa was significantly greater in the control animals than in the protein-depleted animals. The mucosal protein per 100 g of body weight was the same in the protein-deprived animals and the control animals. The specific activity of the intestinal mucosal protein was higher in the protein-deprived animals than in the controls. In the protein-deprived animals the proximal segment incorporated more radioactive amino acid into mucosal protein than did the distal segment at 3, 6, 12, and 24 hr after the amino acid was given P. O. A similar difference was found between the proximal and distal segments of the control animals 6 hr after administration p.o., when the *l*-^{3}H-leucine was given i.p. to both groups of animals there was no difference between proximal and distal small intestine.

4486 **HORMONAL CONTROL OF BRUNNER'S GLANDS.** *(E.)* Stening, G. F. (U. California Sch. Med., Los Angeles) and M. I. Grossman. *Gastroenterology* 56(6):1047-1052, 1969.

In 3 dogs (weighing 17-21 kg) and 4 cats (weighing 2.5-4 kg) with isolated pouches of the first portion of the duodenum, containing Brunner's glands, the highest rates of secretion, 1.0 ml per 15 min in dogs and 0.7 ml per hr in cats, were attained by *ad libitum* feeding. Continuous i.v. infusions of natural or synthetic porcine secretin produced dose-related responses. Maximal responses to secretin were 0.8 ml per 15 min in dogs and 0.7 ml per hr in cats; the dose required for maximal response was 2 μg per kg/hr in both species. Lower levels of stimulation occurred with histamine, pure porcine gastrin II, pure cholecystokinin-pancreozymin, and pure caerulein.

4487 **MONOAMINE OXIDASE ACTIVITY IN THE HUMAN SMALL INTESTINE.** *(E.)* Mustala, O. (Second Dept. Med., U. Helsinki, Finland), E. Solatunturi and S. Tarpila. *Acta Med Scand* 185(3):145-146, 1969.

Monoamine oxidase (MAO) activity in the epithelium of the normal human (4 male, 6 female, average age 50.3 yr) small intestine was found to be very high, 28.0 nmol IAA/mg/hr, which is higher than the MAO activity in other tissues. After nialamide treatment (150 mg/day p.o.) for two weeks the activity was reduced by 85% (4.3 nmol IAA/mg/hr). (This is about the same as that after pargyline and isocarboxazide and cannot be the explanation of the fewer side effects of nialamide.) The decrease in MAO activity in small intestine epithelium may be an important factor in the circulatory reactions which patients treated with monoamine oxidase inhibitors sometimes have after eating food containing monoamines (e.g. cheese).

4488 **STUDIES ON THE SECRETIONS FROM ISOLATED DUODENAL LOOPS.** *(E.)* Cooke, A. R. (UCLA Med. Sch., Los Angeles, Calif.). *Amer J Dig Dis* 14(6):394-399, 1969.

Volume and electrolyte composition were studied in the juice of isolated duodenal loops in 3 dogs. The mean volume rate of fasting basal secretion was 0.7 ml/30 min. A significant increase in volume ($p < 0.05$) and bicarbonate output ($p < 0.05$) was found in response to a 600 g meat meal. Bicarbonate concentrations of sodium and bicarbonate were similar to those of blood plasma, whereas the concentrations of chloride and potassium were higher.

4489 PURIFICATION AND PROPERTIES OF RABBIT INTESTINAL SUCRASE. *(E.)* Takesue, Y. (Res. Inst. Environ. Med., Nagoya U., Japan). *J Biochem* 65(4): 545-552, 1969.

Rabbit intestinal sucrase, associated with the microvillous membrane of the mucosal cell, was solubilized with papain and purified by using its reversible absorption on Sephadex G-200 and gel filtration on Bio-Gel P-300. The purified enzyme was homogeneous after ultracentrifugation and disc electrophoresis analyses. The sedimentation coefficient of the enzyme was 10.0S and its molecular weight was estimated to be about 235,000. It hydrolyzed maltose and alpha-methylglucoside in addition to sucrose, but not alpha, alpha-trehalose. Beta-glucosides and alpha- and beta-galactosides tested were not hydrolyzed. Melezitose served as a substrate but raffinose did not. The maltase activity present in the homogenate paralleled sucrase activity during purification. The enzyme is therefore a glucosido-sucrase or an alpha-glucosidase. The purified sucrase showed maximal activity at about pH 6.5 in 0.05M phosphate buffer, but the level of activity was affected by the kind of cations present. Alkali metal ions stimulated the sucrase activity in the absence of buffer. Sucrase was inhibited by many metal chlorides.

4490 THE EFFECT OF TOTAL COLECTOMY ON MORPHOLOGY AND ABSORPTIVE CAPACITY OF ILEUM IN THE RAT. *(E.)* Wright, H. K. (Yale U. Sch. Med., New Haven, Conn.), T. Poskitt, J. C. Cleveland and T. Herskovic. *J Surg Res* 9(5):301-304, 1969.

Sprague-Dawley rats (52) were used to study the mechanism of adaptation of intestinal absorption after colectomy, by measuring morphologic changes and absorptive capacity of the ileum before and 2 months after total colectomy and ileoproctostomy. Net water absorption in the ileum increased from 0.17 ml/cm/hr in preoperative and control animals to 0.28 ml/cm/hr 2 months after colectomy. Average ileal villus length increased 42% and the number of mucosal cells from crypt to tip of villus increased 51%. Both ileal absorptive surface and absorptive capacity increase after total colectomy in the rat. The enhancement of water-absorptive capacity in the intestinal remnant is probably the mechanism of functional adaptation after colectomy.

4491 THE EXCRETION OF HISTAMINE AND HISTAMINE METABOLITES BY THE KIDNEY AND GASTROINTESTINAL TRACT OF THE RABBIT. *(E.)* Lippert T. H. (Dept. Pharmacol., U. Heidelburg, Germany) and L. Ehe. *Int Arch Aller* 36(3):290-297, 1969.

The excretion of ^{14}C-histamine and its metabolities by the kidney and the gastrointestinal tract was studied in male rabbits (weighing 2.8-4.3 kg) after i.v. infusions of ^{14}C-histamine. In addition to the kidney, all parts of the gastrointestinal tract were found to eliminate histamine and its metabolites. Under normal conditions, the kidney is responsible for about 93% and the gastrointestinal tract for 7% of the total ^{14}C excretion While in the urine about 13% of the total ^{14}C excreted was in the form of unchanged histamine, in the contents of the gastrointestinal tract nearly all consisted of ^{14}C-histamine metabolites. The percentages of total ^{14}C and ^{14}C-histamine excreted, in relation to the ^{14}C-histamine infused did not differ at the 2 dose levels studied except for the stomach, in which an increased excretion occurred after administration of the higher dose. After histamine pretreatment, the excretion of total ^{14}C by the kidney was slightly dimished and that by the gastrointestinal tract was slightly increased. The relationship of ^{14}C-histamine to total ^{14}C excreted in normal rabbits did not differ substantially from those with histamine pretreatment.

4492 THE SECRETORY ACTIVITY OF THE SMALL INTESTINAL SEGMENT WHICH HAS BEEN USED FOR PLASTIC RECONSTRUCTION OF THE RESECTED STOMACH. *(Rus.)* Khrushcheva, Ie. A. (A. V. Vishnevskii Inst. Surg., Acad. Med. Sci., Moscow, USSR) and P. G. Karvonidi. *Eksp Khir Anest* 13(4):39-42, 1968.

4493 INFLUENCE OF TEMPERATURE ACCLIMATIZATION ON THE IONIC ACTIVATION OF GOLDFISH INTESTINAL ADENOSINE TRIPHOSPHATASE. *(E.)* Smith, M. W. (Agric. Res. Counc. Inst. Anim. Physiol., Babraham, Cambridge, England), V. E. Colombo and E. A. Munn. *Biochem J* 107(5):691-698, 1968.

See also: 4317,4328,4335,4751

GENERAL

4494 **HEPATO-PORTAL HEMODYNAMICS DURING ANESTHESIA WITH FLUOTHANE (EXPERI-MENTAL RESEARCH).** *(It.)* Foti, F. (Inst. Gen. Clin. Surg., J. Catania, Italy), M. Zanghì, A. Russo, E. Cirino, E. Barbaro nd N. Alberti. *Chir Pat Sper* 16(1):71-80, 1968.

/ariations in the hemodynamics of the portal circulation during luothane anesthesia were studied in 6 dogs. During the surgical hase of anesthesia, the systematic, portal and suprahepatic enous pressure decreased resp. 45, 33, and 20%. The constant f radioactive gold clearance (K) decreased from 0.301 to 0.144 nd hepatic flux from 33.1 ml/kg/min to 15.9 ml/kg/min. Vith return to consciousness all values returned to normal.

495 **PREVENTION BY CORTISONE OF HISTAMINE-INDUCED GASTRIC ULCER IN GUINEA PIG.** *E.)* Djahanguiri, B. (Inst. Exp. Med. Pharmacol., Fac. Med., J. Tehran, Iran), M. A. Khoyi and D. Sadeghi. *Acta Med Iranica* 1(1-2):9-12, 1968.

hree groups of 25 guinea pigs were studied. The first and e second groups were injected i.p. with 200 mg/kg cortisone cetate; the second and the third were injected i.p. 2 hr later ith 2 mg/kg of a 1:5000 normal saline solution of histamine hosphate. Six hours later the animals were sacrificed, the omachs removed, opened along the greater curvature, washed, d examined carefully by direct light without knowledge of e treatment. The 25 animals in the first group which received only cortisone showed no ulcers. There were 17 animals (68%) with ulcers in the group receiving only histamine. the group receiving both agents there were 7 animals (28%) ith ulcers. It is possible that cortisone prevented ulcers by s anti-inflammatory action.

496 **NECROTIC HEPATITIS INDUCED BY A DIET CONTAINING AFLATOXIN IN THE** ***IACOCHOERUS AETHIOPICUS.*** *(Fr.)* Quenum, C. (Fac. ed. Pharm., Dakar, Senegal), M. Martineaud and J. Cros. *R Soc Biol* 161(8/9):1767-1772, 1968.

e effects of aflatoxin were studied in a 4-months-old warthog. diet consisting of 15% protein, 11% of lipids, and 74% carhydrates was contaminated with 1 mg aflatoxin/kg food. fter 3 months on this diet the animal died. Macroscopic amination showed an enlarged, congested and fibrous liver th lesions mainly in the right lobe and on the upper side. icroscopic study showed hemorrhagic necrosis in the middleoar region; fibrosis with inflammatory infiltration of lymphotes; intracellular and intracapillary cholestasis; nuclear hyperophy and interstitial infiltration.

97 **THE LIGATION OF THE PORTAL VEIN IN THE RAT.** *(Fr.)* Ruckebusch, Y. (Natl. Inst. plied Sci., Lyon, France) and M. L. Grivel. *C R Soc Biol* 2(1):96-103, 1968.

10 groups of 10 adult Wistar rats, ligation of the portal n was carried out, first partially and then, after 3 weeks, mpletely. Three weeks after complete ligation examination owed loss of weight (20%), decrease in the weight of the lneys (8-10%), hepatic atrophy, associated with splenic hypertrophy (value increase of 30%). Atrophine given p.o. was more slowly inactivated and the mydriatic effect persisted for a long time. The examination of the cardiovascular system, after injection of 20 mg/kg of dopamine and after 5 μg/kg of noradrenaline, showed a more severe bradycardia after dopamine and a more prolonged hypertension after noradrenaline than in controls. The collateral circulation increased rapidly after complete ligation and the metabolic deficit was constant only in a short period before the vascular reorganization of the liver.

4498 **THE ACTION OF ACETYLCHOLINE, BRADYKININ AND ANGIOTENSIN ON LIVER BLOOD FLOW IN THE ANESTHETIZED DOG AND ON THE PRESSURE IN THE LIGATED DUCTUS CHOLEDOCHUS.** *(Ger.)* Scholtholt, J. (Physiol. Inst., U. Düsseldorf, Germany) and T. Shiraishi. *Pflueger Arch Ges Physiol* 300(1):189-201, 1968.

The blood flow in the hepatic artery and portal vein of anesthetized dogs was measured by an electromagnetic flowmeter. Acetylcholine, bradykinin, and angiotensin were separately infused into the hepatic artery and portal vein and the effect on arterial blood flow, portal vein pressure and pressure in the ligated common bile duct studied. Acetylcholine and bradykinin caused a marked increase in the blood flow in the hepatic artery regardless of the infusion site. Angiotensin caused a reduction in blood flow. Intraarterial infusion of acetylcholine increased portal vein pressue due to vasoconstriction. A 25-fold increase in the quantity of acetylcholine infused into the portal vein did not manifest a similar effect. Bradykinin had no effect on portal pressure. Angiotensin increased portal pressure markedly particularly during intraportal infusion. This pressure increase is believed due to marked constriction of intrahepatic portal ramifications. Acetylcholine and bradykinin seem to stimulate bile secretion because they increase the pressure of the ligated common bile duct only when intraarterially infused. The extensive arterial plexus around the small bile ducts seems to have some function in the formation of bile.

4499 **EXPERIMENTAL INTESTINAL OBSTRUCTION IN THE RAT. I. GENERAL OBSERVATIONS.** *(E.)* Láng, I. (1st Dept. Surg., U. Med. Sch., Budapest, Hungary) and A. Erdélyi. *Acta Chir Acad Sci Hung* 9(1):59-66, 1968.

Rats were anesthetized with ether, the abdominal cavity opened by median laparotomy and the small intestine ligated by thick silk thread distally to the duodenojejunal flexure or 4 cm proximally to the ileocecal juncture. (The thread was knotted around a probe about 1 mm thick to avoid intestinal injury.) After local antibiotic application the abdomen was closed. The animals were given milk ad lib but no solid food. Control animals were treated similarly except for the intestinal ligation. The first group of 20 rats was subjected to duodenojejunal ligation and the second group of 31 to ileocecal ligation. Changes after duodenojejunal ligation were serious: at 24 hr the animals were weak, ceased to drink and regurgitated fluid with increasing frequency. Few animals survived the 48th postoperative hr. All members of the ileocecal group were alive, showed normal behavior, moved, and drank normally 24 hr postoperatively. Increased meteorism was observed from the second day. The animals moved less, became apathetic, and reacted more weakly to stimuli. They became comatose on the third day. While the number of surviving animals in the 2 experimental groups was similar at 24 hr, the difference in mortality was significant at 48 and at 72 hr. All animals in both groups died by the 96th hr, at which time no controls had died. Because of the restricted diet there was a gradual loss of weight in the control group. In the duodenojejunal group there was no loss of weight on the first day, it was similar to control values at 48 hr and exceeded the values for the control and ileocecal groups at 72 hr. Ileocecal occlusion did not affect body weight up to the 72nd hr, but at 96 hr exceeded that of controls. In the duodenojejunal group the intestines and the stomach were distended proximally to the ligature at 24 hr; the stomach contained air and 10-15 ml bile-stained fluid. The serosa was richly vascularized; the gastric mucosa showed petechiae, erosions and ulceration. Distension peaked at 48 hr; intestinal content was fluid and yellowish; serosal and mucosal changes were pronounced. Circulatory changes were similar to those observed in shock. The phenomena may be due to neuroendocrine compensation, or to the effect of bradykinin escaping from the damaged cells of the intestinal mucosa.

4500 EXPERIMENTAL INTESTINAL OBSTRUCTION IN THE RAT. II. CIRCULATORY CHANGES IN THE SMALL INTESTINE, LIVER AND KIDNEY.

(E.) Erdélyi, A. (1st Dept. Surg., U. Med. Sch., Budapest, Hungary) and I. Láng. *Acta Chir Acad Sci Hung* 9(1):67-75, 1968.

Ileocecal ligation was performed on 40 inbred albino rats. Mean arterial pressure was measured by a mercury manometer and cardiac output by the dye-dilution method. A modification of Sapirstein's fractionated indicator-dilution technique was used to determine organ blood flow. Circulatory parameters were assessed in the small intestine proximally to the point of ligature, in its immediate vicinity and distally to it. The changes in body, liver and kidney weights were recorded 24-, 48-, and 72-hr after ileocecal ligation. Only the liver weight at 48- and 72-hr was significantly decreased. The intestinal fraction of cardiac output decreased slightly after ligation, but the decrease was insignificant compared to the control values. The blood flow to the ligated segment decreased about 50% at 24 hr. The decrease was less in the segment distal to the ligature.

4501 QUANTITATIVE DETERMINATION OF VEINS IN THE TRANSITIONAL ZONE BETWEEN STOMACH AND ESOPHAGUS IN MAN.

(Ger.) Ferraz de Carvalho, C. A. (Inst. Anat., U. Sao Paulo, Brazil) and P. C.P. Lemos. *Anat Anz* 123(3):342-355, 1968.

The area and perimeter of sections (1 cm apart and transverse to the longitudinal axis of the segment) of the mucosa and submucosa veins in 9 different levels of the transitional segment between the esophagus and stomach were determined, using 10 preparations obtained from individuals (only 1 had liver cirrhosis and the rest had no pathologic abnormalities) between the ages of 28-60 yr (4 males, 6 females). A strong hydrodynamic resistance exists in the venous rete mirabile system of the transitional zone of the stomach and esophagus, in which the blood flows from the portal vein to the vena cava. The veins of this segment (taking the above blood flow into consideration) resist this flow, therefore, the intramural plane of the venous circulation between the stomach and esophagus is of a functionally terminal type. In this system of great hydrodynamic resistance limited spaces exist where this resistance can fall due to slight increases in pressure and the pathologic preparation in this study confirms this theoretical conclusion.

4502 A NEW EXPERIMENTAL APPROACH IN THE STUDY OF CHRONIC ALCOHOLISM. IV. REPRODUCTION OF ALCOHOLIC CIRRHOSIS IN RATS AND THE ROLE OF LIPOTROPES VERSUS VITAMINS.

(E.) Porta, E. A. (Hosp. Sick Children, Toronto, Canada), O. R. Koch and W. S. Hartroft. *Lab Invest* 20(6):562-572, 1969.

By giving sweetened alcohol to 160 male Wistar rats consuming separately an originally adequate basal diet, it was possible to create in the final dietary regimen (alcohol plus food) inadequacies capable of severely injuring the liver. Fatty livers, hepatofibrosis, cirrhosis, and Mallory bodies were thus reproduced in rats. The deficiency of lipotropes induced by either alcohol or sucrose was more important than deficiency of vitamins, similarly induced, in the development of these changes. The consumption of appreciable amounts of alcohol by rats for up to 7 months will not produce liver damage in rats given adequate dietary protection. However, the degree of Mallory body formation was inversely related to alcohol- or sucrose-induced deficiencies of lipotropes and vitamins.

4503 AFLATOXIN CARCINOGENESIS: INHIBITION OF LIVER CANCER INDUCTION IN HYPOPHYSECTOMIZED RATS.

(E.) Goodall, C. M. (Natl. Cancer Res. Lab., U. Otago, New Zealand) and W. H. Butler. *Int J Cancer* 4(4):422-429, 1969.

Intact (20) and hypophysectomized (37) male MRC albino rats were fed aflatoxin at a dose (4 μg/g in diet) sufficient to produce liver cancers in all of the 14 intact rats surviving 49 weeks. No liver tumors were induced in the 14 hypophysectomized rats which survived this latent period even though these animals received aflatoxin at a higher rate than the intact control animals. Tumors of extrahepatic tissues—particularly of the retro-orbital lacrimal glands—were induced in the hypophysectomized rats. Aflatoxins may require metabolic activation before becoming effective carcinogens for rat liver.

4504 GASTRIC EROSIONS AND GASTRO-INTESTINAL BLEEDING IN RATS WITH PORTOCAVAL ANASTOMOSIS.

(E.) Doyle, D. (Dept. Pathol., U. Edinburgh, Scotland). *Brit J Exp Path* 12(2):196-199, 1969.

End-to-side portacaval anastomosis was performed on 38 adult Wistar rats. Normal and sham operated animals were also observed. Of the 12 male rats, 9 had erosions and of the 26 female rats 16 had gastric erosions with hemorrhage, while the other 10 had neither erosions nor hemorrhage. Two of the 10 erosion-free female animals had melena stools (positive for occult blood) several weeks before death, but at autopsy no cause was found. Acute erosions were found in the glandular part of the stomach. No abnormalities were noted in the squamous-lined ruminal stomach, esophagus, or elsewhere in th intestines. The number of lesions ranged from 2 to countless, and in size from minute to 1.5 mm diameter. They were breaches in the gastric mucosa not penetrating muscularis mucosae. The margins were sharply punched out and the immediately adjacent mucosal cells seemed healthy. The craters contained bile-stained debris but there were no occluded blood vessels nearby. Inflammatory reaction was minimal; a few more polymorphs were present in the nearby tissues than usual. Blood was often present as 'coffee grounds' in the stomach, blue discoloration in the small intestine and as melena in the colon. During the first 20 days after operation there were losses in body weight of up to 40%. A period of relative stability was followed by an increase until some of those surviving over 80-100 days had recovered their lost weight. None resumed its former growth curve. Body weight changes occurred in spite of adequate food and appetite.

4505 SEQUENTIAL EFFECTS OF CHEMICALLY DIFFERENT CARCINOGENS, DIMETHYLNITROSAMINE AND 4-DIMETHYLAMINOAZOBENZENE, ON HEPATOCARCINOGENESIS IN RATS. *(E.)* Takayama, S. (Cancer Inst., Tokyo, Japan) and T. Imaizumi. *Int J Cancer* 4(4):373-383, 1969.

Induction of liver tumors was studied in 304 Donryu rats given carcinogens as follows: 1) N-nitrosodimethylamine (DMN) alone, 2) 4-dimethylaminoazobenzene (DAB) alone, 3) DMN followed by DAB, and 4) DAB followed by DMN. DAB feeding for 0.62 to 2.5 months, followed by DMN feeding for 5 months, induced liver carcinomas more frequently than did DMN alone given for 5 to 10 months, or DAB alone given for 2.5 months. Likewise, DMN feeding for 0.62 or 1.25 months, followed by DAB feeding for 5 months, induced liver carcinomas more frequently than did DMN alone given for 5 to 10 months or DAB alone given for 2.5 months. When DMN was given for a longer time (2.5 months), followed by DAB for 5 months, 50% of the induced liver tumors were nonepithelial. Liver tumors were induced by sequential administration of the 2 carcinogens in doses that did not induce tumors when each carcinogen was given alone over a comparable time period. The latent period for liver tumor development was shorter in groups that received the 2 carcinogens sequentially than in those that received DAB or DMN alone for comparable time periods.

4506 MYOCARDIAL EFFECTS OF INTESTINAL ISCHEMIA. *(E.)* Williams, L. F. Jr. (Boston City Hosp., Mass.), A. H. Goldberg, B. J. Polansky and J. J. Byrne. *J Surg Res* 9(5):319-323, 1969.

Further evidence for a cardiac defect in the dog (10 animals) related to intestinal ischemia was obtained from a bioassay of peripheral plasma using an isolated heart muscle (rat) preparation, and from electrocardiographic observations. The data indicate that within 1 hr after occlusion of the superior mesenteric artery of dogs, there is a substantial decrease in cardiac output. This decrease is progressive, and in 1½ to 3 hr is accompanied by electrocardiographic changes that suggest decreased coronary flow. By 2 hr after release of a 2-hr occlusion, the cardiac output is severely impaired and electrocardiographic abnormalities are present. In addition, a negative inotropic factor capable of directly depressing isolated myocardial tissue can be detected in peripheral blood. The primary hemodynamic effect of intestinal ischemia may be the production or the release of a substance with myocardial depressant activity, resulting in arterial hypotension, decreased cardiac output, and diminished coronary perfusion. Splanchnic blood flow may then be further reduced, leading to a self-sustaining cycle that accelerates the cardiovascular deterioration.

4507 A NEW EXPERIMENTAL DEVICE FOR *IN VITRO* STUDY OF THE FUNCTIONS OF THE SMALL INTESTINE. *(E.)* Johnson, L. (Akad. Sjukhuset, Uppsala, Sweden), G. Nylander and Å. Svensson. *Acta Chir Scand* 135(3):241-247, 1969.

A new experimental procedure, consisting principally of an *in vitro* specimen of small intestine with pulsatile blood flow, was used. The segment of bowel is perfused via its mesenteric artery with homologous blood from the jugular artery of another animal while drainage from the portal vein tributary is channeled into the other animal's jugular vein. The segment of bowel is placed in a Ringer's solution bath and while perfusion is taking place, intestinal motility, direct microscopy changes, arterial and venous pressure levels, the absorption rate of radioactive materials from the intestinal lumen and the uptake of perfused radioactive material by the intestinal mucosa can be studied.

4508 SEGMENTAL REPLACEMENT OF THE COMMON BILE DUCT. *(E.)* Ludwick, J. R. (U. Michigan Med. Sch., Ann Arbor). *Ann Surg* 170(2):249-255, 1969.

A series of 12 mongrel dogs (average weight 18.7 kg) and 10 rhesus monkeys (average weight 7.7 kg) were studied during 1 yr after replacement of 10-25 mm segments of common bile ducts with teflon prostheses. The procedure was well tolerated by all animals without mortality. Smooth muscle in the wall of the monkey's common bile duct provides a compensatory mechanism after cholecystectomy which is not available in the canine common bile duct. Reconstitution of the common bile duct occurs over the teflon prosthesis by scar contracture resulting in an approximately 1 mm zone of fibrous union.

4509 HEMODYNAMIC ABNORMALITIES SECONDARY TO EXTRACELLULAR FLUID DEPLETION IN INTESTINAL OBSTRUCTION. *(E.)* Billig, D. M. (Baylor U. Coll. Med., Houston, Texas) and P. H. Jordan Jr. *Surg Gynec Obstet* 128(6):1274-1282, 1969.

Clinical, hemodynamic, and blood chemical data were obtained in 9 male patients (average age 46 yr) with acute nonstrangulated obstructions of the small intestine and 4 (average age 43 yr) without fluid or electrolyte problems. Patients with no detectable dehydration had a normal cardiac index, central venous pressure, and blood chemistries. Patients with minimal dehydration had a decrease in cardiac index, low central venous pressure, and some hemoconcentration. No azotemia or changes were noted in the ionic composition of the plasma. Patients with moderate dehydration had a longer history of illness, more severe emesis, and the hemodynamic abnormalities were greater. Azotemia and minimal sodium depletion were also present. Rehydration, with solutions containing sodium salts, restored the circulatory and chemical abnormalities to normal in both groups. Clinical evaluation and central venous pressure monitoring were the best guides to the estimation of dehydration and its effect on cardiac output. Central venous pressure was an excellent index of the adequacy of replacement therapy.

4510 **ALIMENTARY PRODUCTION OF GALLSTONES IN HAMSTERS. 22. THE INFLUENCE OF A NON-ABSORBABLE BILE ACID BINDING RESIN, CHOLESTYRAMINE, ON FORMATION OF GALLSTONES IN HAMSTERS.** *(E.)* Sondergaard, E. (Polytechnic Inst., Copenhagen, Denmark), I. Prange and H. Dam. *Z Ernaehrungswiss* 9(2-3):174-179, 1969.

The influence of the bile-acid binding, nonabsorbable substance cholestyramine on alimentary production of gallstones in young (30 to 32 days) hamsters was examined by rearing 1 group of the animals on a diet without added fat containing 74.3% glucose as the carbohydrate component (and twice the usual amount of vitamins A, D_3, and E), and another group on the same diet supplement with 3% cholestyramine at the expense of glucose. The animals were killed and autopsied after having received the experimental diets for 42-43 days. The cholestyramine supplement markedly reduced the production of cholesterol gallstones, but not to the same extent as has been obtained in previous experiments when the glucose in the basal diet was replaced by rice starch. The cholestyramine supplement markedly favored the production of amorphous pigmented gallstones, an effect not encountered when cholesterol gallstones were eliminated by replacing the content of glucose in the basal diet by rice starch. The growth of the animals was not significantly retarded by the cholestyramine supplement, and none of the animals showed gross signs of fat-soluble vitamin deficiency. The amount of vitamin A in the livers was of the order of magnitude of 100 μg/g in both groups, but significantly lower in the group receiving cholestyramine than in the group receiving the unsupplemented diet.

4511 **GASTRIC BLOOD FLOW AND ITS DISTRIBUTION DURING RESTRAINT.** *(E.)* Edlich, R. F. (U. Minnesota Med. Sch., Minneapolis), L. Urdaneta and C. Hansen. *Aerospace Med* 40(6):600-602, 1969.

Gastric blood flow and its distribution were determined by the ^{86}Rb clearance technique in 8 control animals and in 9 dogs undergoing restraint. The gastric perfusion rate of the restrained animal was significantly lower (35%) than the gastric perfusion rate of the controls. The reduction in the gastric perfusion rate of the experimental group may be a consequence of a significant decrease in cardiac output (25% less than control) or a result of an undetermined intermediary affecting both the heart and the gastric microcirculation. Restraint had no effect on gastric blood flow among the various tissue layers.

4512 **PATHOGENETIC FACTORS IN EXPERIMENTAL BOVINE OESOPHAGOSTOMOSIS. III. DEMONSTRATION OF PROTEIN-LOSING ENTEROPATHY WITH ^{51}Cr-ALBUMIN.** *(E.)* Bremner, K. C. (Div. Anim. Hlth., CSIRO, Long Pocket Lab., Brisbane, Australia). *Exp Parasit* 24(3):364-374, 1969.

Australian Illawarra Shorthorn bull calves (6) infected with 10,000 larvae of *Oesophagostomum radiatum* and 3 worm-free calves were injected i.v. with ^{51}Cr-albumin during the hypoproteinemic phase of the disease. In 5-7 days after injection the infected calves excreted in the feces a mean of 9.8% of the ^{51}Cr administered, as compared with a mean excretion of 1.6% by the controls. The mean daily fecal loss of ^{51}Cr by the infected animals was equivalent to 972 ml of plasma and that of the controls to 144 ml. The mean apparent half-life of the labeled albumin in the blood of the infected calves was 2.7 days, and in the worm-free animals 7.0 days. The abnorma losses of ^{51}Cr began 20-21 days after exposure and continued for at least 5 weeks. Greatest losses of ^{51}Cr occurred in the cecum and colon and were associated with the 5th stage of the parasite's life cycle. More than 60% of the ^{51}Cr in solution in colon contents was protein-bound, and albumin was the predominant protein present, with a specific activity similar to tha of circulating albumin. Protein-losing enteropathy is a significant factor in the production of the hypoproteinemia of bovine esophagostomosis.

4513 **INTRASYSTEMIC INTERRELATIONS BETWEEN THE ORGANS OF THE ALIMENTARY CANAL.** *(Rus.)* Filippovich, S. I. (Inst. Norm. Pathol. Physiol., Acad. Med. Sci., Moscow, USSR). *Vestn Akad Med Nauk SSSR* 23(12):3-11, 1968.

4514 **RESISTANCE FACTORS TO CHEMOTHERAPY (R FACTORS) OBSERVED IN STRAINS OF ENTEROBACTERIA ISOLATED IN SOUTHERN ITALY AND SICILY.** *(It.)* Giammanco, G. (Inst. Hyg., U. Palermo, Italy), D. Natoli, A. Carmeni and F. Giacalone. *Boll Soc Ital Biol Sper* 44(21):1794-1797, 1968.

4515 **INTERFERENCE IN ENTEROVIRUS INFECTIONS.** *(It.)* Mazzuccato, P. (Inst. Hyg., U. Cagliari, Italy), A. Tagliamonta, P. La Colla, A. Molle and F. Demontis. *Boll Soc Ital Biol Sper* 44(21):1757-1761, 1968.

4516 **ERUCTATION IN RUMINANTS.** *(E.)* Dougherty, R. W. (Natl. Anim. Dis. Lab., U.S. Dept. Agric., Ames, Iowa). *Ann NY Acad Sci* 150(1):22-26, 1968.

4517 **CARBON MONOXIDE UPTAKE IN THE GUT.** *(E.)* Coburn, R. F. (Sch. Med., U. Pennsylvania, Philadelphia). *Ann NY Acad Sci* 150(1):13-21, 1968.

4518 **PERITONEAL ELECTROLYTE ABSORPTION: ANALYSIS OF PORTAL, SYSTEMIC VENOUS, AND LYMPHATIC TRANSPORT.** *(E.)* Kraft, A. R. (Ohio State Coll. Med., Columbus), R. K. Tompkins and J. E. Jesseph. *Surgery* 64(1):148-153, 1968.

4519 **INTRAHEPATIC VASCULAR RESPONSE TO NYLIDRIN HCl.** *(E.)* Geumei, A. (Fac. Med., U. Alexandria, Egypt) and M. Mahfouz. *Surgery* 63(2):306-311, 1968.

4520 ***IN VIVO* TISSUE-SPECIFIC RECOGNITION BY HEPATIC CELLS.** *(E.)* Bhargava, K. (Regional Res. Lab., Hyderabad, India) and P. M. Bhargava. *Exp Cell Res* 50(3):515-523, 1968.

4521 **ANALYSIS OF THE STIMULATORY ACTION OF CAPSAICIN ON RECEPTORS AND SENSOR FIBRES OF THE SMALL INTESTINE IN THE CAT.** *(E.)*

Baraz, L. A. (Inst. Norm. Pathol. Physiol., Acad. Med. Sci. USSR, Moscow), V. M. Khayutin and J. Molnár. *Acta Physiol Acad Sci Hung* 33(2):225-235, 1968.

4522 PHYSIOLOGICAL AND CLINICAL ASPECTS OF THE DIGESTIVE HORMONES. *(Sw.)* Jorpes, E. (Dept. Chem., Karolinska Inst., Stockholm, Sweden) and V. Mutt. *Lakartidningen* 65(21):2189-2202, 1968.

4523 RELATIONS BETWEEN THE LAREDO STRAIN OF *ENTAMOEBA HISTOLYTICA*, *ENTAMOEBA INVADENS* AND *ENTAMOEBA MOSHKOVSKII* DETERMINED ON THE BASIS OF THEIR SENSITIVITY TO ANTIAMEBIC DRUGS. *(It.)* De Carneri, I. (Fac. Med. Surg., U. Pavia, Italy). *G Mal Infett* 20(3):320-327, 1968.

4524 PERSISTENCE OF GASTROINTESTINAL-SPECIFIC ANTIGENS IN PRIMARY CULTURE OF HUMAN COLON EPITHELIUM. *(E.)* Ghose, T. (Dept. Pathol., Monash U., Melbourne, Australia), R. C. Nairn and M. Cerini. *Exp Cell Res* 49(3):513-519, 1968.

4525 LOCAL AND SYSTEMIC CIRCULATORY EFFECTS OF GASTROINTESTINAL DISTENSION. *(E.)* Nemir, P. Jr. (Sch. Med., U. Pennsylvania, Philadelphia). *Ann NY Acad Sci* 150(1):96-100, 1968.

4526 THE USE OF EXPIRED AIR TO MEASURE INTESTINAL GAS FORMATION. *(E.)* Calloway, D. H. (U. California, Berkeley) and E. L. Murphy. *Ann NY Acad Sci* 150(1):82-95, 1968.

4527 DEMONSTRATION OF THE LYTIC ACTIVITY OF THE PROXIMAL COLON ON THE MICRO-ORGANISMS OF THE DIGESTIVE TRACT OF THE RABBIT. *(Fr.)* Bonnafous, R. (Inst. Physiol., Toulouse, France) and P. Raynaud. *Arch Sci Physiol (Paris)* 22(1):57-64, 1968.

4528 DIGESTION IN THE ABOMASUM AND INTESTINE OF THE YOUNG CALF. (AN EXPERIMENT USING PRECOOKED OATMEAL ADDED TO MILK). *(It.)* Accardi, F. (Inst. Gen. Zootechnol., U. Palermo, Italy). *Boll Soc Ital Biol Sper* 44(11):978-980, 1968.

4529 PHYSIOLOGY OF THE COLON AND RECTUM. *(Rev.)(E.)* Williams, R. D. (Broward Gen. Med. Ctr., Fort Lauderdale, Fla.). *Amer J Surg* 117(6):849-853, 1969.

4530 COLON ISCHEMIA FOLLOWING RESECTION OF ABDOMINAL AORTIC ANEURYSMS. [CASE REPORT] *(E.)* Sweetman, W. R. (Good Samaritan Hosp., Portland, Ore.). *Amer Surg* 35(8):580-584, 1969.

4531 BLOOD FLOW THROUGH THE STOMACH AND DUODENUM. CLINICAL ASPECTS. *(Rev.)(E.)* Womack, N. A. (U. North Carolina Sch. Med., Chapel Hill). *Amer J Surg* 117(6):771-780, 1969.

4532 LOCAL THERMODILUTION METHOD FOR MEASURING BLOOD FLOW IN THE PORTAL AND RENAL VEINS OF THE UNANAESTHETIZED RABBIT. *(E.)* White, S. W. (Sch. Physiol., U. New South Wales, Sydney, Australia), J. P. Chalmers, R. Hilder and P. I. Korner. *Aust J Exp Biol Med Sci* 45(5):453-468, 1967.

4533 HEPATIC VENOUS OCCLUSION ASSOCIATED WITH INTRAHEPATIC NARROWING OF THE INFERIOR VENA CAVA. A CASE SUCCESSFULLY TREATED BY PERICARDIAL GRAFT. *(E.)* Hepner, G. W. (Hammersmith Hosp., London, England), R. E. Steiner and H. H. Bentall. *Brit J Surg* 56(4):245-249, 1969.

4534 PHYSIOPATHOLOGY OF THE HEMODYNAMICS OF THE ESOPHAGEAL VENOUS PLEXUS. [EDITORIAL] *(It.)* Dòmini, R. *Arch Ital Mal Appar Dig* 35(5):415-420, 1969.

4535 DEVELOPMENTAL BASIS OF THE PORTAL VENOUS SYSTEM. *(E.)* Marks, C. (Case Western Res. U. Sch. Med., Cleveland, Ohio). *Amer J Surg* 117(5):671-681, 1969.

4536 COMPARISON OF TWO PERFUSATES IN AMMONIA METABOLISM OF ISOLATED RAT LIVERS. *(E.)* Barak, A. J. (U. Nebraska Coll. Med., Omaha) and H. C. Beckenhauer. *Proc Soc Exp Biol Med* 131(3):886-890, 1969.

4537 THE HEPATOTOXICITY OF 1,3-BIS(2-CHLOROETHYL)-1-NITROSOUREA (BCNU) IN RATS. *(E.)* Thompson, G. R. (Sch. Pharm. Oregon State U., Corvallis) and R. E. Larson. *J Pharmacol Exp Ther* 166(1):104-112, 1969.

4538 SUBSENSITIVITY OF THE RAT ILEUM TO CHOLINERGIC DRUGS. *(E.)* McPhillips, J. J. (West Virginia U. Med. Ctr., Morgantown). *J Pharmacol Exp Ther* 166(2):249-254, 1969.

4539 NORMAL AND ABNORMAL PHYSIOLOGY OF THE ALIMENTARY TRACT IN INFANCY. *(Rev.)(E.)* Tyson, K. R. T. (U. Texas Med. Br., Galveston). *Amer J Surg* 117(6):876-880, 1969.

4540 INTESTINAL DISTENTION PRODUCED BY NITROUS OXIDE OR ETHYLENE INHALATION. *(E.)* Cundy, R. L. (VA Hosp., Denver, Colo.), J. A. Aldrete and J. Thomas. *Surg Gynec Obstet* 129(1):108-112, 1969.

See also: 4580,4942

DIAGNOSTIC PROCEDURES

4541 THE USE OF ELECTRO-LABORATORY TESTS IN DIAGNOSIS OF ACUTE APPENDICITIS.

(Rus.) Samofalov, A. A. (S. M. Kirov Leningrad Inst., Postgrad. Med., USSR). *Vestn Khir Grekov* 99(10):50-54, 1967.

The use of electrical tests in the supplemental diagnosis of appendicitis was studied in 410 patients with acute abdomen, of whom 180 underwent surgery. Different forms of acute appendicitis were found in 166 of the 180. Of the 166 patients 142 were diagnosed correctly clinically, while 160 were correctly diagnosed when the supplementary tests were used. The electrical tests consist of: division of the abdominal cavity into 6 symmetrical regions; use of an electrical device to measure rectal temperature and the skin temperatures in the 6 abdominal regions; use of a galvanometric test for pain on each of the abdominal regions and taking local WBC counts from the finger and the right side of the abdomen.

4542 EXPERIENCE WITH THE LOPRESTI OESOPHAGOSCOPE.

(E.) Renner I. G. (Queen Elizabeth Hosp., Woodville, South Australia) and A. K. Grant. *Med J Aust* 1(15):767-768, 1969.

In a consecutive series of 169 esophagoscopies there were 15 failures and 25 instances in which no abnormality was found. In the remaining 129 cases 154 abnormalities were noted (95 esophageal, 59 gastric). The esophageal lesions included esophagitis (62), reflux without esophagitis (15), varices (10), cancer (6), and stricture (1). Esophagoscopic examination was carried out on 43 patients with an intact stomach and the following pathology was noted: cancer, 17; chronic gastric ulcer, 10; severe hemorrhagic gastritis, 5; Mallory-Weiss syndrome, 3; other, 2. Among 16 patients with an abnormal surgically-treated stomach there were 8 patients each with gastritis and stomal ulceration. The fiberoptic esophagoscope was safe and was particularly helpful in visualizing the upper regions of the stomach and gastroenterostomy stomas.

4543 THE APOMORPHINE TEST II. EXPERIMENTAL STUDIES IN PEPTIC ULCER PATIENTS.

(E.) Gudmand-Hoyer, E. (Surg. Dept., Rigshosp., Copenhagen, Denmark), H. E. Kallehauge and H. J. Fenger. *Scand J Gastroent* 3(6):654-658, 1968.

The apomorphine test was studied in 44 gastrectomized patients: 25 had a Billroth II resection; 14 a Billroth I resection, and 5 vagotomy and pyloroplasty. The patients (27 males and 17 females) were examined 1 yr after surgery at the earliest. The symptoms provoked by s.c. injection of 0.5 mg apomorphine were compared with the spontaneous dumping symptoms reported by the patient and with the symptoms produced by an oral glucose test meal (50 g glucose/250 ml water). The glucose test preceded the apomorphine test in half the cases, in the others the order was reversed. If apomorphine is a suitable agent for an evaluation of the dumping syndrome in patients it must not provoke symptoms without syndrome. Conversely, it should provoke all the symptoms quantitatively in those patients with the dumping syndrome. Gastric surgery should not alter the response pattern. Thirteen healthy volunteer subjects, experienced no dumping symptoms after either apomorphine or glucose. Based on 427 provocations, apomorphine fulfilled the criteria and is recommended for use in a preoperative dumping test.

4544 EXPERIENCE WITH THE FIBRESCOPE GASTROCAMERA.

(E.) Otaki, A. T. (West London Hosp., England), T. Dundas and A. M. Gill. *Amer J Gastroent* 51(3):187-199, 1969.

The results in 65 of 66 patients examined with a fiberscope gastrocamera are reported. Five malignant ulcers, 11 benign ulcers and 2 erosions were found among 46 patients whose recent barium studies showed no evidence of gastric ulceration as such. Only 6 (54%) of 11 definite radiological gastric ulcers were confirmed. Two gastric ulcers were found among 7 patients with equivocal X-rays. Difficulty in visualizing and photographing was found particularly at the pylorus and upper lesser curvature. Thirteen visual examinations were specifically inadequate and 4 of these may have been significant to the result. Out of 812 exposed frames (12.3 frames per film) only 386 (47.5%) were entirely satisfactory. The remainder were affected by overlapping, under- and overexposure and poor focus. The ease of introduction and examination make the fiberscope useful in the elderly and its flexibility makes it ideal for teaching purposes.

4545 THE DISCRIMINATORY ABILITY OF A GALACTOSE TOLERANCE TEST AND SOME OTHER TESTS IN THE DIAGNOSIS OF CIRRHOSIS OF THE LIVER, HEPATITIS AND BILIARY OBSTRUCTION.

(E.) Tengström, B. (U. Hosp., Uppsala, Sweden). *Scand J Clin Lab Invest* 23(2):159-168, 1969.

Fifty-five patients with cirrhosis of the liver, 44 with suspected cirrhosis but negative biopsies, 29 with infectious hepatitis and 23 with obstructive jaundice were evaluated by intravenous galactose tolerance tests and serum determinations of alkaline phosphatase, SGPT, total bilirubin and thymol turbidity. Galactose tolerance tests were the best means of distinguishing between cirrhosis and noncirrhosis. Along with alkaline phosphatase they were more effective in the differentiation of cirrhosis and obstructive jaundice. Thymol turbidity and alkaline phosphatase were equally effective in differentiating between icteric hepatitis and obstructive jaundice.

4546 USE OF CUPROUS THIOCYANATE AS A SHORT-TERM CONTINUOUS MARKER FOR FAECES.

(E.) Dick, M. (U. Coll. Hosp., London, England). *Gut* 10(5):408-412, 1969.

Cuprous thiocyanate (CuSCN) is suggested as a marker in faecal fat studies. Copper in feces may be estimated by chemical or atomic absorption methods following the addition of nitric acid, boiling and filtration. Recovery was in excess of 99% in 14 volunteers during 79 four-day balance studies. No toxicity was noted, but variable thiocyanate absorption was observed.

4547 DIAGNOSIS OF INTESTINAL OBSTRUCTION WITH SPECIAL REGARD TO PLAIN ROENTGEN EXAMINATION OF THE ABDOMEN.

(E.) Tibblin, S. (Lunds Lasarett, Sweden). *Acta Chir Scand* 135(3):249-252, 1969.

A retrospective study of cases of intestinal obstruction hospitalized during the course of 1 yr is taken as the basis for a critical appraisal of plain roentgen examination of the abdomen in mechanical intestinal obstruction. Two partially overlapping series are presented. One consisted of 72 cases of clinically verified mechanical intestinal obstruction in which the patients simultaneously came to plain roentgen examination of the abdomen. The causes of obstruction included incarcerated hernia (14), adhesions (24), intussusception (10), volvulus (4), obstructive carcinoma of the colon (10), mesenteric vascular occlusion (3) and bowel stenosis (7). False negative roentgen findings were recorded in 14 cases (just under 20%). The second series was made up of 65 cases in which plain roentgen examination revealed mechanical intestinal obstruction. In 12 of these the roentgen findings were falsely positive (slightly less than 20%). When there is a discrepancy between the clinical and roentgen features, prompt roentgen examination after a contrast swallow is recommended unless immediate operation is indicated.

4548 EVALUATION OF SOME LABORATORY PROCEDURES FOR THE DIAGNOSIS OF SCHISTOSOMIASIS. *(E.)* Garcia, E. G. (Inst. Hyg., U. Philippines, Diliman, Rizal), B. D. Cabrera, Z. A. Cristi and R. B. Silan. *Acta Med Philipp* 4(3):130-137, 1968.

A comparative evaluation of stool examination, the intradermal test, the circumoval-precipitin test, and the passive hemagglutination test using *S. japonicum* adult whole worm or egg extracts as antigens was carried out in 104 patients, most of whom were hospitalized. Of the 104 parasitically proven cases, 99.0% were positive by the intradermal test, 94.2% by the circumoval-precipitin test, 85.6% by the hemagglutination test on adult whole worm extracts, and 76.9% by the hemagglutination test on egg extracts. Among nonexposed parasitically negative controls the intradermal test gave 11.2% false positives (16 of 143) and the hemagglutination test on adult whole worm extracts 13.5% false positives (10 of 74). Only 1 false positive among 183 subjects was encountered with the circumoval-precipitin test and none with the hemagglutination test with egg extracts. Stool examinations failed to demonstrate eggs or were negative in 66.6% of cases positive by rectal biopsy. Among 53 referred cases positive by serological tests, at least 71% were missed by stool examination. The intradermal test should be used only as a screening procedure; at least 1 circumoval-precipitin test should be performed when it is not possible to otherwise demonstrate evidence of parasites.

4549 THE DIAGNOSIS OF HEPATIC METASTASES BY MEANS OF RECTALLY ADMINISTERED RADIOIODINE. *(E.)* Tukiainen, P. (Dept. Radiol., U. Helsinki, Finland), K. Kiviniitty, M. Forss and C. E. Unnérus. *Oncology* 22(4):269-272, 1968.

Twenty-three patients with liver metastases were studied. After digital rectal examination to exclude the presence of feces, 40 μC ^{131} I in 5 ml water were introduced by catheter inserted 10 cm into the rectum. A scintillation detector with a collimeter 7 cm in diameter was placed in contact with the skin at the intersection of the right mid-clavicular line and a horizontal line passing through the xyphoid process. The scintillation counter was coupled to a rate meter recording the milliammeter combination. Recording was started at the same time as the injection of ^{131}I. A metastatic index was defined as the activity after 12 min and other activities were related to it. The test was positive in all 23 patients. The diameter of the liver metastases was usually 2-10 cm but in 1 patient it was 0.5 cm. Controls were 40 patients with metastases to various organs and a negative ^{131}I test. There was no evidence of liver metastases either at laparotomy or at autopsy. Two patients had palpable nodules of the liver tract similar to metastases but at operation no hepatic metastases or nodules of the liver metastases to other organs were observed. In 2 patients the metastatic index was uncertain: after X-ray and cyclophosphamid treatment, laparotomy showed the liver to be normal. The ^{131}I test was normal after the operation.

4550 PRELIMINARY RESULTS OF THE PENTAGASTRIN TEST. *(It.)* Garberini, S. (Ospedale Maggiore S. Carlo Borromeo, Milan, Italy) and R. Sampietro. *Chir Gastroent* 2(4):399-409, 1968.

The effects of pentagastrin (0.8 μg/kg) on the stimulation of gastric acid secretion were compared with the effects of histamine (0.04 mg/kg) in 45 patients 21 with duodenal ulcers, 3 with histologically confirmed benign gastric ulcers, 6 with carcinoma of the stomach, and 15 controls without any disease of the gastrointestinal tract. The results in mEq of total acidity secreted in the same patients during the second 30 min were: in patients with duodenal ulcer after stimulation; histamine 18.45 and pentagastrin 19.60; in gastric ulcer patients, histamine 8.35 and pentagastrin 9.80; in stomach cancer patients, histamine 4.95 and pentagastrin 4.70. Values in normal patients were: histamine 10.05 and pentagastrin 19.60. The reproducibility of the test was verified in experiments on 4 patients with duodenal ulcer and 1 healthy subject.

4551 HEPATIC ARTERIOGRAPHY. *(E.)* Alfidi, R. J. (Cleveland Clin. Found., Ohio), E. Buonocore and C. H. Brown. *Radiology* 90(6):1136-1142, 1968.

Celiac and superior mesenteric arteriograms of 195 patients were studied. The control group consisted of 96 patients in whom later biochemical, histologic, or clinical studies showed no evidence of hepatic disease. The other 99 patients comprised the test group. In 52 of 99 patients the presence of liver disease was confirmed by biopsy at surgery, or at autopsy. In 16 cases of hepatic vascular disease demonstrated by arteriography, biopsy was contraindicated or considered unnecessary. Definitive diagnosis could not be established in 7 patients because they did not return for follow-up or refused surgery. It was found that the degree of arterial tortuosity is inversely proportional to the liver mass. There is decreased tortuosity in hepatomegaly and increased tortuosity in the liver that has lost volume (e.g., in cirrhosis). The arterial capillary phase is a valuable indicator for diagnosing hepatic parenchymal disease. When the hepatogram lacked uniform density it was considered abnormal; however, it showed the highest positive correlation with disease of the liver.

4552 THE KINETICS OF RADIOACTIVE ROSE BENGAL (^{131}I) IN THE DIFFERENTIAL DIAGNOSIS OF NORMAL SUBJECTS, CIRRHOTIC, AND CHOLESTATIC PATIENTS. *(It.)* Cravario, A. (Inst. Gen. Clin. Med., U. Turin, Italy), P. G. De Filippi and G. Molino. *Boll Soc Ital Biol Sper* 44(18):1498-1501, 1968.

In 15 normal subjects, 10 cirrhotic and 7 cholestatic patients, a model of the kinetics of 131I-Rose Bengal was tested, using simultaneous determinations by the conventional hepatogram and of the hematic kinetics of the dye, by means of a counter situated at the level of the temporal region. The plasma BSP clearance constant (K) was also determined. The average values obtained with the model, were, for normal, cirrhotic and cholestatic patients, resp.: 0.0792, 0.0367 and 0.0372 for the constant of transfer between blood and liver; 0.0201, 0.0183 and 0.0331 for the constant of transfer between the liver and the blood; 0.0074, 0.0078 and 0.0023 for the intrahepatic passage to the biliary ducts; 0.0447, 0.0923 and 0.0051 for the fractional flux of the biliary system. The average values of K were: 0.239, 0.094 and 0.077 resp.

4553 THE COMBINED USE OF SCINTIGRAPHY AND PUNCH BIOPSY IN THE DIAGNOSIS OF METASTASES OF GASTRIC CARCINOMA INTO THE LIVER.

(Rus.) Konovalov, N. I. (N. N. Petrov Inst. Oncol., Moscow, USSR) and N. P. Fadeiev. *Med Radiol (Moskva)* 13(12):41-46, 1968.

Fifty-five patients with gastric cancer without hepatomegaly or evidence of inoperability were examined. Scanning of the liver was carried out with ^{131}I-Rose Bengal or ^{198}Au. In accordance with the results scintillation scanning, punch biopsy of the liver was carried out with aspiration or nonaspiration techniques and histological and cytological studies were made. Scintigrams were pathologic in 31 of 55 patients. In 23 the changes were local, and in 8, diffuse. In the 29 patients in whom biopsies were performed, histological studies showed: metastases of gastric cancer in 8, fibrosis in 6, adipose dystrophy in 7, cirrhosis in 1, deposits of lipofuscin in 2, hepatic adenoma in 1, normal hepatic tissue in 3 and hematoma in 1. Scintigraphic findings agreed with biopsy results in 90%. The combined diagnostic techniques showed metastases to the liver in 15% of patients with gastric cancer.

4554 CLINICAL ASPECTS OF A STUDY INTO HEPATIC HEMODYNAMICS BY DETERMINING CARDIO-PORTAL CIRCULATION TIME AND BY USE OF PUNCTURE BIOPSY FINDINGS IN CHRONIC DIFFUSE DISORDERS OF THE LIVER.

(Rus.) Podymova, S. D. (Sechenov Med. Inst., Moscow, SSR) and T. F. Novikova. *Sovet Med* 31(3):37-41, 1968.

The time of cardioportal circulation with ^{131}I-labeled human serum albumin was contrasted with the findings of liver puncture biopsy in 131 patients suffering from chronic diffuse diseases of the liver. Of these, 75 had cirrhosis of the liver; 15, adipose dystrophy; 11, benign hyperbilirubinemia; and 30 chronic hepatitis. The most prolonged circulatory time was 41.6 sec in patients with cirrhosis of the liver. Statistically significant differences were established as indicators of cirrhosis and chronic hepatitis, making differential diagnosis possible in early stages of the diseases. Diagnosis of cirrhosis on the basis of greatly lengthened cardioportal circulation time was corroborated by liver biopsy findings. The fact that vascular decompensation precedes parenchymatous decompensation apparently explains this marked increase. The increase was also accompanied by a sharp histiolymphoid infiltration and an increase in Kupffer cell proliferation. In chronic hepatitis increased cardioportal circulation time may have prognostic significance, indicating a need for liver puncture. Findings showed that shortened cardioportal circulation time accompanied other clinical signs of improvement in the patient's condition after treatment of various liver disorders.

4555 RADIOISOTOPE SCANNING IN THE TOPICAL DIAGNOSIS OF TUMORS AND TUMOR-LIKE DISEASES OF THE LIVER.

(Rus.) Bregadze, I. L. (Minist. Hlth., Moscow, USSR), O. B. Milonov, O. A. Umbrumyants and B. A. Shlevkov. *Khirurgiia (Moskva)* 44(5):144-150, 1968.

The authors analyzed diagnostic results of radioisotope scanning in 59 patients with tumors and tumor-like processes of the liver, in 55 of which cases it proved satisfactory. Of these patients 30 suffered from metastatic tumors of the liver; 12 showed either hydatid or alveolar echinococcosis. The findings were later confirmed either in surgery or by an autopsy. Radioisotope scanning proved particularly valuable in revealing disturbances in absorption of radioactive substances in hepatic segments and disclosed structural changes in hepatic tissue in all patients with cancer, echinococcosis and other diseases earlier than any other method and with a high degree of reliability. However, in small neoplasms (up to 15-20 mm in diameter), results were not reliable. In localized liver disorders in alveolor echinococcosis this method proved sufficiently precise to determine positions, size and nature of gall stones, the amount of hepatic parenchyme retained, the topographic location and contures of the gallbladder. In advanced and complex stages of alveolar echinococcosis it aided in determing diffusion of the process by means of related disorders of liver and kidneys. In hepatic abscesses not only can position and size be determined, but also an evaluation of consequent functional disturbances in the liver made. This method ought to be more widely used since there are practically no counterindications for its application and it can be employed when other techniques are not practicable.

4556 STUDY OF GASTRIC SECRETION AFTER CAFFEINE AND HISTAMINE LOADING IN CHILDREN WITH DUODENAL ULCERS.

(Sl.) Horečný, K. (Med. Fac. Comenius U., Bratislava, Czechoslovakia) and G. Nováková. *Cesk Pediat* 23(5):385-389, 1968.

Samples of gastric juice were collected at 15 min intervals for 2 hr after administration of 0.1 g of caffeine in 200 ml water or 0.01 mg/kg body weight of histamine hydrochloride to 2 groups of 25 children each with duodenal ulcers. Mařatka's method was used to determine gastric acidity after administration of caffeine, and gastric secretion and acidity were measured by Lambling's method after histamine. Acidity curves obtained by Mařatka's method were characteristic of duodenal ulcers in only 12 of these 25 cases. The rest of the curves showed no consistent pattern, and 3 patients secreted little or no acid. With Lambling's test, acid secretion was elevated or, in a small number of cases, about the same as in normal adults. Only 2 children secreted less than 80 ml and less than 3 mEq HCl during the test. None of the children had achlorhydria. Thus, Mařatka's method is considered of value only for screening purposes, while Lambling's method is of great practical value for diagnosing duodenal ulcers.

DIAGNOSTIC PROCEDURES

4557 DIAGNOSTIC AND PROGNOSTIC VALUE OF CHOLESTEROL FRACTIONS IN INFECTIOUS HEPATITIS. *(Rum.)* Pîrvu, C. (Clin. Infect. Dis., Cluj, Romania) and E. Frenkel. *Cluj Med* 41(1):89-97, 1968.

Bloor's method was used to determine free and esterified cholesterol in sera from 63 children and adults with different clinical forms of viral hepatitis. In the first week of the infection the ratio of esterified to total cholesterol was low in 95% of the cases and the mean value for total cholesterol was in the low normal range. In the second week the mean value for total cholesterol increased slightly and the esterified fraction was in the low normal range; the ratio of esterified to total cholesterol was normal in 85% of the cases. These findings suggest that there is a deficiency of cholesterol esterase synthesis in the liver during the first 2 weeks of viral hepatitis. Findings were essentially the same in children and adults, but in children there was a more sudden increase in the esterified and total cholesterol fractions during the second week. Cholesterol values were found to have no prognostic value in children or adults with mild or moderately severe hepatitis. However, much greater changes were seen in patients with severe and prolonged cases of hepatitis. In these cases the esterified cholesterol fraction was still low in the seventh week of the infection.

4558 THE VALUE OF RADIOLOGICAL EXAMINATION OF THE ARTIFICIALLY HYPOTENSIVE SMALL INTESTINE FOR THE DIAGNOSIS OF CHRONIC ENTERITIS. *(Rus.)* Linevskii, Iu. V. (Donetsk Med. Inst., USSR) and I. S. Pavlova. *Vestn Rentgen Radiol* 43(1):34-37, 1968.

Radiological examinations were made on 50 patients with enteritis or enterocolitis, aged 19-52 yr, and 10 normal controls. Artificial hypotension of the small intestine was induced by i.v. administration of 1 ml of 0.1% atropine sulfate combined with 10 ml of 10% $CaCl_2$. The small intestine was then filled with a barium suspension through a 3 m sound which was gradually withdrawn. Characteristic features of chronic enteritis were small filling defects which looked like small polyps, thickening of the rugae, and a flattened relief. These changes were found in different combinations, depending upon the severity of the enteritis. The filling defects were the most consistent finding and were present in some patients with mild, moderately severe, and severe enteritis. Filling defects were not found with conventional radiological methods. Changes in the rugae were most often found in patients with severe and moderately severe enteritis.

4559 MEASURING FAT ABSORPTION IN THE INTESTINE BY MEANS OF EXTERNAL COUNTING. *(Rus.)* Ishmukhametov, A. I. (Inst. Med. Radiol., Acad. Med. Sci., Moscow, USSR), Ie. N. Denisov, A. N. Reginskii, E. A. Shakirov and Z. M. Bobokhodzhaiev. *Med Radiol (Moskva)* 12(12):57-61, 1967.

4560 RADIOISOTOPIC INVESTIGATION OF THE SALIVARY GLANDS. *(Rus.)* Yudin, L. A. (Sechenov 1st Moscow, Med. Inst., USSR). *Med Radiol (Moskva)* 12(12):14-21, 1967.

4561 MODERN TECHNIQUES FOR EVALUATING INTESTINAL FUNCTION. *(It.)* Careddu, P. (Inst. Pediat., U. Milan, Italy). *Minerva Pediat* 19(27):1663-1668, 1967.

4562 NEEDLE BIOPSY OF THE LIVER. *(E.)* Payne, W. H. (Royal North Shore Hosp., Sydney, Australia). *Med J Aust* 1(8):368-369, 1967.

4563 THE IMPORTANCE OF FECAL TESTS FOR THE INTERPRETATION OF THE PATHOGENICITY OF INTESTINAL PARASITES. *(Fr.)* Bailenger, J. (Lab. Zool. Anim. Biol., Cent. U. Hosp., Bordeaux, France), J. J. Dubarry and F. Seguin. *Ann Biol Clin (Paris)* 25(10/12): 1249-1254, 1967.

4564 METHOD FOR THE DETECTION OF DYSENTERY ANTIGENS BY MEANS OF THE HEMAGGLUTINATION INHIBITION REACTION. *(Rus.)* Shmuter, L. M. (Ukrainian Inst. Postgrad. Med., USSR). *Zh Mikrobiol* 45(6):113-117, 1968.

4565 PHOTOVIDEOMETRY: THE SYNCHRONIZATION OF ELECTROMANOMETRY WITH TELEVISION FOR THE STUDY OF DUODENAL-INTESTINAL MOTILITY. *(It.)* Melchionda, N. (Inst. Spec. Med. Pathol., U. Bologna, Italy), A. De Vecchis, F. Benfenati, G. Scondotto, E. Roda and G. Peta. *Arch Ital Mal Appar Dig* 35(3):247-261, 1968.

4566 LACTASE DEFICIENCY IN ADULTS: VALUE OF THE LACTOSE ABSORPTION CURVE. *(Por.)* Vasconcellos, D. (Fac. Med., Fed. U. Pernambuco, Brazil) and A. Conçalves. *Arq Gastroent* 5(4):159-164, 1968.

4567 BEHAVIOR OF THE LIPIODOL TEST IN MALABSORPTION SYNDROMES. *(E.)* Barbieri, D. (Sch. Med., U. São Paulo, Brazil), J. V. Martins Campos, E. Marcondes and G. Quarentei. *Arq Gastroent* 5(4):173-178, 1968.

4568 DIFFICULTIES IN THE DIAGNOSIS OF CHRONIC APPENDICITIS IN CHILDREN. *(Pol.)* Kapszewicz, M. (Pediat. Surg. Clin., Acad. Med., Lódż, Poland). *Wiad Lek* 21(22):2019-2024, 1968.

4569 VALUE OF THE DUODENAL CATHETER IN DIAGNOSING HYDATID CYSTS OPENING INTO THE BILIARY TRACT. *(Sp.)* Cieza, Rodriguez, L. F. and A. Moszenberg. *Prensa Med Argent* 55(29):1402-1405, 1968.

4570 EXTRAPERITONEAL TRANSUMBILICAL PORTOHEPATOGRAPHY. *(Rus.)* Vĭtsyn, B. A. (Med. Inst., Novosibirsk, USSR), N. A. Nikoforova and A. V. Stasenko. *Klin Khir (Kiev)* (12):1-5, 1968.

4571 IMAGE-INTENSIFIER FLUOROGRAPHY IN STUDIES OF THE STOMACH. *(Sw.)* Holm, T. (U. Hosp., Lund, Sweden) and J. Kaude. *Lakartidningen* 65(4):359-371, 1968.

DIAGNOSTIC PROCEDURES

4572 THE LIMITATIONS OF LIVER FUNCTION TESTS AND SOME RELATED REMARKS. *(Jap.)* Hase, M. (Nihon U. Sch. Med., Tokyo, Japan), H. Atsumi, Y. Ono, K. Gomi, H. Chujo and Y. Inomata. *Nichidai Igaku Z* 27(3):311-319, 1968.

4573 CHOLEDOCHOTOMY IN THE ABSENCE OF PREOPERATIVE CHOLANGIOGRAPHY. *(Fin.)* Harjola, P. T. (Kemi Cent. Hosp., Finland) and P. Ketonen. *Duodecim* 84(22):1304-1307, 1968.

4574 HEPATOGRAPHY: THE USE OF RECTALLY ADMINISTERED RADIOACTIVE IODINE IN THE DIAGNOSIS OF LIVER METASTASES. *(Fin.)* Tukiainen, P. (U. Hosp., Helsinki, Finland), K. Kiviniitty, M. Forss and C. E. Unnérus. *Duodecim* 84(22):1298-1303, 1968.

4575 DIAGNOSIS OF BILHARZIASIS. *(Por.)* Martins Da Rocha, R. *J Soc Ciên Méd Lisboa* 133(5): 407-410, 1969.

4576 THE APPLICATION OF THE THEORY OF PROBABILITY TO THE EVALUATION OF ANAMNESTIC DATA IN DIFFERENTIAL DIAGNOSIS OF STOMACH DISEASE. *(Pol.)* Brodziak, A. (3rd Clin. Intern. Dis., Silesian Acad. Med., Katowice, Poland), E. Kosek and E. Czogala. *Pol Tyg Lek* 22(45):1722-1725, 1967.

4577 SPONTANEOUS INTRA-ABDOMINAL HAEMORRHAGE. *(E.)* Jakobus, J. W. (U. Stellenbosch, S. Africa). *S Afr Med J* 41(45):1158-1162, 1967.

4578 DIAGNOSIS AND TREATMENT OF NON-PENETRATING ABDOMINAL TRAUMA. *(It.)* Viviani, C. (Ca' Granda Gen. Hosp., Milan, Italy) and G. Petrocchi. *Chir Ital* 18(3):438-465, 1966.

4579 CLINICAL EVALUATION AND TECHNIQUE OF THE NEEDLE BIOPSY OF THE LIVER. *(Rus.)* Usov, D. V. (Altai Med. Inst., USSR) and I. N. Zolotov. *Vestn Khir Grekov* 99(10):29-32, 1967.

4580 HEPATIC VEIN VISUALIZATION BY INTRAVENOUS CARBON DIOXIDE INJECTION. *(E.)* Collins, J. R. (VA Hosp., Nashville, Tenn.) and V. A. Vix. *Radiology* 89(5):864-867, 1967.

4581 THE RADIOLOGICAL ASSESSMENT OF GASTRIC ACID OUTPUT. *(E.)* Moghadam, M. (Henry Ford Hosp., Detroit, Mich.), R. Gluckmann and W. R. Eyler. *Radiology* 89(5):888-892, 1967.

4582 LAPAROSCOPY IN SYMPTOMS OF HEPATOPATHIES. *(It.)* Caldara, G. (Ospedale di Circolo di Cantu, Italy). *Arch Sci Med (Torino)* 124(2):208-219, 1967.

4583 EXAMINATION OF SPUTUM, BRONCHIAL LAVAGE AND BRONCHIAL BIOPSY FOR OVA IN BILHARZIAL HEPATOSPLENOMEGALY. *(E.)* Shoeb, S. M. (Ain Shams U. Cairo, Egypt), K. Basmy, M. A. Habib, H. H. Youssef and S. E. Warraki. *J Trop Med Hyg* 70(12):293-295, 1967.

4584 PRESENT STATE OF THE EARLY DIAGNOSIS OF GASTRIC CANCER. *(Rev.)(Por.)* Zaterka, S. *Arq Gastroent* 6(2):65-67, 1969.

4585 CONSIDERATIONS ON THE VALUE OF SUCTION BIOPSY OF THE STOMACH. *(E.)* Schindler, R. (Loma Linda U., Calif.). *Rev Ass Med Minas Gerais* 19(2):99-101, 1969.

4586 SOME ABDOMINAL TUMORS AND THEIR RADIOLOGIC DIAGNOSIS. *(Fr.)* Bismuth, V. (St. Louis Hosp., Paris, France), M. Bléry, J.-P. Desprez-Curely. *Ann Radiol* 11(11/12):869-874, 1968.

4587 CONTRIBUTION TOWARDS SCINTILLATION STUDY OF THE PANCREAS. *(It.)* Barbieri, L. L. (Inst. Gen. Med. Clin. Ther. Med., U. Bologna, Italy), G. A. Lanfranchi and P. Puddu. *Arch Ital Mal Appar Dig* 35(4):345-363, 1969.

4588 DIAGNOSTIC VALUE OF AUSCULTATION OF THE ABDOMINAL VESSELS (7 CASES). *(Fr.)* Dupres, M. F. (Rouen, France). *Arch Mal Appar Dig* 58(4/5): 233-244, 1969.

4589 USE OF CODEINE IN INTRAVENOUS CHOLANGIOGRAPHY. *(It.)* Ragni, G. (Dept. Radiol., U. Turin, Italy) and F. Sacchetto. *Minerva Radiol* 14(1/2):41-48, 1969.

4590 ENDOSCOPIC OBSERVATIONS IN PATIENTS WITH ESOPHAGEAL AND GASTRIC DISORDERS SUBMITTED TO ANTI-INFLAMMATORY THERAPY WITH PROXAZOLE CITRATE. *(It.)* Mirelli, E. (Gen. Surg. Clin., U. Milan, Italy) and G. Fichera. *Policlinico (Chir)* 76(3):196-220, 1969.

4591 AN ANALYSIS OF INTESTINAL BIOPSY. *(Kor.)* Chung, M. H. (Coll. Med., Yonsei U., Seoul, Korea). *Korean J Intern Med* 12(2):133-142, 1969.

4592 THE SIGNIFICANCE OF CHOLEDOCHO-PANCREATIC REFLUX IN CHOLANGIOGRAPHY. *(Rus.)* Kotiger, Ya. S. (Beltsy Republican Hosp., USSR). *Vestn Khir Gregov* 99(9):72-76, 1967.

4593 DIFFICULTIES IN THE X-RAY DIAGNOSIS OF THE STOMACH. *(Fr.)* Gramatopol, D. (Bucharest, Romania). *J Belg Radiol* 52(3):128-131, 1969.

4594 PERCUTANEOUS NEEDLE BIOPSY IN LIVER PATHOLOGY. *(It.)* Caldara, G. (Ospedale di Circolo di Cantu, Italy). *Arch Sci Med (Torino)* 124(3):331-339, 1967.

4595 RETENTION AND CLEARANCE OF SULFOBROMOPHTHALEIN. TECHNIQUE, INDICATIONS AND RESULTS. *(Sp.)* Bellomo, J. A. (Hosp. Natl. Clin., Buenos Aires, Argentina). *Prensa Med Argent* 56(3): 108-117, 1969.

See also: 4280,4304,4306,4322,4342,4408,4476,4482,4615,4656,4698,4728,4754,4793,4796,4831,4863,4872,4873,4874, 4905,4912,4918,4936.4945,4957,4981,5007,5015,5084

GASTROINTESTINAL DISEASES

ESOPHAGUS

4596 MILD CONGENITAL STRIDOR AND DEGLUTITION DIFFICULTIES IN THE INFANT. *(Fr.)*
Nusslé, D. (Canton Hosp., Lausanne, Switzerland) and M. Savary. *Rev Med Suisse Rom* 88(7):516-525, 1968.

Case reports are presented of 69 children (only 2 were older than 2 yr; examined by radiocinematography and protography) with either or both a respiratory stridor or deglutition difficulties. A stridor was present in 45 cases and associated with deglutition difficulty in 44 of the cases. Of 67 cases with deglutition difficulties, only 41 had been clinically diagnosed. Vomitus was the main symptom in 35 cases. In 41 cases (6 without vomitus) a malpositioned cardio-tubersity was found, with predominant hypotonia of the lower esophagus and marked reflux of the cardia. Cerebral palsy type neurologic alterations were found in 33 cases; 9 of them had a history of fetal pain or neonatal asphyxia. In cases of laryngeal stridor, the pharyngolaryngotracheal region showed a violent lowering and bending of the laryngeal cartilage and the aryepiglottic folds at every inspiration, and a lowering of the larynx with folding of the cervical trachea. The epiglottis remained straight while the trachea contracted. When the esophagus was filled with a contrast substance, a strong attraction between the 2 ends of the esophagus toward the thorax was observed. At times, the pull showed a hiatal hernia with an open cardia.

4597 FACTORS ASSOCIATED WITH CANCER OF THE ESOPHAGUS, MOUTH, AND PHARYNX IN PUERTO RICO. *(E.)* Martinez, I. (Dept. Hlth., San Juan, Puerto Rico). *J Nat Cancer Inst* 42(6):1069-1094, 1969.

A case-control, community-based study of 400 patients with cancer of the esophagus, mouth, and pharynx examined environmental and dietary factors and familial aggregation. Twelve hundred age- and sex-matched controls were interviewed and asked the same questions as were the cancer patients. Both controls and patients had diets deficient in fresh fruits, vegetables, meat, eggs and milk, but high in beans and carbohydrates in the form of rice, bread, and such starchy roots as potatoes and sweet potatoes. Cancer patients differed significantly from controls in that they used more alcohol, tobacco, hot beverages (mostly coffee), and spices. Their meals were fewer, scantier, and more irregular, served very hot and without beverage.

4598 HIATUS HERNIA: REPAIR BY RIGHT-SIDED, SUBHEPATIC, ANTERIOR GASTROPEXY. *(E.)*
Boerema, I. (U. Amsterdam, Netherlands). *Surgery* 65(6):884-893, 1969.

Differences between hiatus hernia and other hernias are pointed out, and anatomical points relating to the repair of hiatus hernia by anterior gastropexy are described. The mobile esophagogastric junction and not the fixed diaphragmatic protrusion influences reflux. The presence of a demonstrable hiatus hernia does not prove the existence of clinical reflux symptoms and its absence does not exclude them. The principles of right-sided, subhepatic, anterior gastropexy are set out, and the operation is described. The recurrence rate is 5%, and this is of the paraesophageal (rolling) type only. Hiatal hernias are difficult to demonstrate in newborns regardless of symptoms. A short esophagus is rarely seen and only 1 case of stricture secondary to reflux esophagitis. Spasm can be distinguished from stricture only at surgery.

4599 DIFFUSE MUSCULAR SPASM (DIFFUSE MUSCULAR HYPERTROPHY OF THE OESOPHAGUS). *(E.)* Nicks, R. (Royal Prince Alfred Hosp., Sydney, Australia), M. Gillies and A. Skyring. *Bull Soc Int Chir* 27(6):637-649, 1968.

Eight of 21 patients (11 males, 10 females) with a clinical history of retrosternal pain and dysphagia of sudden onset, in whom peristaltic waves were replaced by synchronous high pressure and frequency waves (confirmed by motility studies) were treated by extended esophagomyotomy. Although all patients had a history of intermittent pain and dysphagia, no organic lesion was demonstrable. All patients had barium studies which showed: all males and 90% of the females had dysphagia; 64% of males and 60% of the females had pain; 41 and 40%, resp., had weight loss, and 48 and 50% resp., had vomiting. The eight patients severely affected with symptoms of less than 2 yr duration, incapacitated, unable to work, afraid to eat, and with severe weight loss submitted to surgery. Cardiomyotomy was performed as for achalasia, except that after carefully freeing the ribbon of loose underlying mucosa from its massive muscular collar the incision was extended as far upwards as the upper border of the aortic arch. Symptoms were permanently relieved in 7 of the 8 patients.

4600 HIATUS HERNIA AND ANAEMIA. *(E.)*
McCormack, R. J. M. (Dept. Clin. Surg., U. Edinburgh, Scotland) and P. R. Walbaum. *J Roy Coll Surg (Edinb)* 13(3):150-154, 1968.

In the period 1960-1966, 239 patients with hiatus hernia were seen. Of these 21 (9%) had severe anemia, defined as a hemoglobin level below 8.9 g/100 ml. Patients with less severe anemia were not included in this study. Eighteen of the patients with severe anemia were female. The average age was 59 yr and the range from 25 to 84. Seven patients presented only anemia symptoms, while 14 had esophageal symptoms also. The serum iron was below the normal range; occult blood was found either intermittently or constantly in 20 of 21 patients. The hernia was of paraesophageal type in 13, sliding in 7 and mixed in 1. No patient had a gastric or duodenal ulcer; none had gallstones as demonstrated by cholecystography. The level of acid secretion was never abnormal. In 5 patients, peptic esophagitis was seen at esophagoscopy. Three of the 21 patients were treated medically with alkali and oral iron; they remained well although anemic. The remaining 18 patients underwent operative reduction of the hernia and repair of the hiatus esophagus. There was no operative mortality and no important postoperative morbidity. All 18 patients were relieved of their esophageal symptoms and have been cured of their anemia. Follow-up at periods of 1-5 yr has shown a hemoglobin level of 12 g/100 ml and no necessity for iron therapy. In only 3 patients has a barium meal been given since surgery. In these no signs of recurrence of hernia or gastroesophageal reflux were seen. It is likely that the anemia was the result of bleeding which results from the hernia itself and not the esophagitis.

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4601 **HIATUS HERNIA. CLINICAL STUDY OF 89 CASES.** *(Por.)* Vasconcellos, D. (Fac. Med., U. Fed. Pernambuco, Recife, Brazil) and T. B. Novais. *Rev Esp Enferm Apar Dig* 27(3):439-452, 1968.

Among 8781 patients with digestive complaints seen between 1953 and 1966, 89 hiatus hernias were diagnosed. In the 1962-1966 period 63 (3.0%) hiatus hernias were diagnosed among 2060 patients examined radiologically. (From the same series 205 duodenal ulcers (9.9%), 56 gastric ulcers (2.7%), 39 gastric cancers (1.8%), and 10 esophageal cancers (0.4%) were diagnosed). Of the 89 cases of hiatus hernia studied, 75 were sliding, 4 were sliding-rolling, and 10 were unclassified. Women outnumbered men (47 to 42; 52.8 to 47.1%). Fifty-six percent of the patients were between the ages of 41-60 yr. The incidence of chronic constipation in the group of 89 hiatus hernia patients was higher (31; 34.8%) than in a control group of 100 patients (22; 22%). Of the female hiatus hernia patients 79% were 5-20 kg above ideal body weight. In 33 an associated disease process was observed: cholelithiasis in 18 (20.2%), duodenal ulcer in 4 (4.5%), intestinal diverticulosis in 4 (4.5%). Important symptoms were: pyrosis (75%), epigastric pain (60.7%), belching (57.1%), regurgitation (53.5%), and gastric fullness (51.7%). Dysphagia occurred in 17.8% of the patients and hematemesis in 5.3%. Fifty six patients were treated conservatively and a good response was obtained in 23.5%, fair in 32.2% and poor in 41.1%. Two of patients who experienced poor results were treated surgically for recurrence of symptoms.

4602 **RESULTS OF 117 ESOPHAGOPLASTIES.** *(Fr.)* Lortat-Jacob, J. L., J. N. Maillard, C. A. Richard, F. Fékété and M. Huguier. *Mem Acad Chir (Paris)* 94(10-11): 334-342, 1968.

Between January 1956 and December 1965 a total of 117 esophagoplasties with the digestive tract were carried out in 112 patients. Sixty three used the technique of Gavriliu with ileo-ascending colon material, 22 used the same material with another surgical technique, 23 used the transverse colon, 8 used jejunal, and 1 used the sigmoid colon. Seventy five were performed for cancer of the esophagus, 32 for extensive caustic stenosis, and 10 for benign conditions. Most of the patients had been dilated: 4 perforations and 1 esophageal-tracheal fistula resulted. Five had been treated at other hospitals with unsatisfactory results. The postoperative mortality rate was 21.4% (28 patients); 22 (29.3%) of the 75 with cancer, 4 (12.5% of those with stenosis, and 2 (20%) of the 10 with other benign conditions. According to the type of surgery the mortality was: 15 of 63 Gavriliu (23.8%), 4 of 22 ileo-ascending colon (18.2%), 6 of 23 transverse colon, (26%), 2 of 8 with jejunum (25%), and 1 of 1 with sigmoid. Twelve of the 28 deaths were attributable directly to the surgery, 16 were indirect (e.g., shock, pulmonary embolism). There were 14 (12%) necroses of which 10 were in the cancer group and 4 in the benign. Among 84 operations in which digestive tract continuity was established, there were 31 (35.5%) fistulas, and 10 stenoses. Fifty-three patients have been followed up for 4 months to 10 yr: most are able to eat normally, 24 have some difficulty with regurgitation.

4603 **SURGICAL TREATMENT OF SO-CALLED SLIDING HIATUS HERNIA IN THE ADULT.** *(Fr.)* Vayre, P. (Vaugirard Hosp., Paris, France) and J. C. Levasseur. *Hopital* 57(795):39-42, 1969.

4604 **REPLACEMENT OF THE ESOPHAGUS BY THE COLON OR STOMACH BY THE ANTERIOR MEDIASTINAL ROUTE.** *(Turk.)* Minkari, T. (Med. Fac., U. Istanbul, Turkey) and M. Tanker. *Turk Tip Cem Mec* 33(10): 595-614, 1967.

4605 **RADIATION THERAPY IN ESOPHAGEAL CANCER.** *(Rus.)* Kozlova, A. V. (Moscow Sci.-Res. Inst. Roentgenol. Radiol., Minist. Hlth., USSR) and Z. F. Lopatnikova. *Med Radiol (Moskva)* 12(9):17-23, 1967.

4606 **RETROSTERNAL PYROSIS.** *(Por.)* Soares, E. C. (Brazilian Inst. Gastroent. Study Res., São Paulo, Brazil), J. P. P. Moraes Jr. and A. Bettarello. *Arq Gastroent* 5(4):155-158, 1968.

4607 **BLEEDING ESOPHAGEAL VARICES.** *(Ger.)* Schreiber, H. W. (Marien Hosp., Hamburg, Germany). *Z Ges Inn Med* 23(23):759-764, 1968.

4608 **PREDNISOLONE IN THE TREATMENT OF EXPERIMENTAL CHEMICAL BURNS OF THE ESOPHAGUS.** *(Rus.)* Iudenich, V. V. *Eksp Khir Anest* 13(4):32-34, 1968.

4609 **ESOPHAGEAL TUMORS INDUCED BY N-METHYL-N-NITROSOANILINE.** *(Rus.)* Napalkov, N. P. (N. N. Petrov Sci. Res. Inst. Oncol., Minist. Hlth. USSR, Leningrad) and K. M. Pozharisskii. *Vop Onkol* 14(12):65-72, 1968.

4610 **EXPERIENCE WITH ESOPHAGOPLASTY AND CONSTRUCTION OF AN ESOPHAGEAL BY-PASS WITH SPECIAL REFERENCE TO ANTETHORACIC ESOPHAGOCOLOGASTROSTOMY.** *(Jap.)* Tanaka, T. (Nihon U. Sch. Med., Tokyo, Japan), O. Inami, K. Takeya, S. Ito, H. Morikawa, Y. Nagai, Y. Takezawa and M. Kishioka. *Nichidai Igaku Z* 27(3):391-397, 1968.

4611 **PSEUDOSARCOMA OF THE OESOPHAGUS. [CASE REPORT]** *(E.)* Hughes, J. H. (Liverpool Royal Infirm., England) and A. H. Cruickshank. *Brit J Surg* 56(1):72-76, 1969.

4612 **PRESSURE RUPTURE OF THE MID-THORACIC OESOPHAGUS.** *(E.)* Bates, M. (North Middlesex Hosp., London, England). *Brit J Surg* 56(5):327-331, 1969.

4613 **RUPTURE OF THE CERVICAL TRACHEA AND ESOPHAGUS. [CASE REPORT]** *(E.)* Gill, A. J. (Johns Hopkins Hosp., Baltimore, Md.). *Arch Otolaryng (Chicago)* 90(1):95-97, 1969.

4614 **A CASE OF ESOPHAGEAL LEIOMYOSARCOMA.** *(Jap.)* Hattri, T., K. Mori, T. Okada, T. Osada, T. Asano, A. Takeichi, T. Kito and H. Kubota. *Jap J Cancer Clin* 13(11):1061-1063, 1967.

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4615 **CYTOLOGICAL DIAGNOSIS OF ESOPHAGUS CANCER.** *(Jap.)* Nakamura, Y., T. Kakegawa, O. Kubo and T. Ro. *Jap J Cancer Clin* 13(10):746-752, 1967.

4616 **GRANULAR CELL MYOBLASTOMA OF THE OESOPHAGUS–A REPORT OF 2 CASES.** *(E.)* Wypkema, W. (Baragwanath Hosp., Johannesburg, S. Africa), A. Schaman, M. C. Path and D. Berson. *S Afr Med J* 41(36): 911-912, 1967.

4617 **ON ESOPHAGOSCOPY AND SWORD-SWALLOWING.** *(E.)* Huizinga, E. (U. Groningen, Netherlands). *Ann Otol* 78(1):32-39, 1969.

4618 **DYSPHAGIA DUE TO RETROESOPHAGEAL RIGHT SUBCLAVIAN ARTERY. SURGICAL MANAGEMENT IN TWO ADULT CASES.** *(Fr.)* Kunlin, A. (Beaujon Hosp., Clichy, France), J. N. Maillard, J. Kunlin, J. P. Binet and M. Huguier. *Ann Chir Thorac Cardiovasc* 8(2):147-150, 1969.

4619 **CARCINOID OF ESOPHAGUS. [CASE REPORT]** *(E.)* Brenner, S. (Montefiore Hosp. Med. Ctr., New York, N. Y.), H. Heimlich and M. Widman. *New York J Med* 69(10):1337-1339, 1969.

4620 **MULTIPLE CANCERS IN OTORHINOLARYNGOLOGY.** *(Fr.)* Greiner, G. F. (Hop. Civil, Strasbourg, France), G. Klotz, C. Conraux, E. Dillenschneider and B. Maitre. *J Franc Otorhinolaryng* 18(6):393-395, 1969.

4621 **CONSIDERATIONS ON THE CLINICAL ASPECTS AND THERAPEUTIC INDICATIONS IN THORACIC ESOPHAGEAL DIVERTICULA.** *(It.)* Puricelli, C. (Gen. Surg. Clin., U. Milan, Italy), N. Bordone and C. Crosta. *Arch Ital Chir* 94(3):328-354, 1968.

See also: 4282,4336,4512,4590,4634,4740,4867

STOMACH

(Gastric ulcer is placed with peptic ulcer)

4622 GASTRIC CANCER IN MAN AND PHYSICAL ACTIVITY AT WORK. *(E.)* Stukonis, M. (U. Coll. Hosp. Med. Sch., London, England) and R. Doll. *Int J Cancer* 4(2):248-254, 1969.

The mortality from gastric cancer in men aged 20 to 64 yr in England and Wales between 1949-53 was related to the physical activity of the occupation in which the men were last employed. Occupation mortality data were taken from the Registrar General (1958), and occupations were classified "light", "intermediate", or "heavy" according to the amount of physical activity (required to perform them). The Registrar General provides occupational mortality data by age for 425 occupations; 87 had to be excluded because occupations in two classes were combined. The remaining 338 occupations were graded according to the physical activity involved. The results, relating to 14,353 deaths from gastric cancer, are summarized. Other diseases (cancer at other sites, gastric ulcer, gastritis, enteritis, and diarrhea) provided little evidence of a relationship between physical activity and the disease. The relationship between mortality from gastric cancer and physical activity may be explained in part by the hypothesis that men doing heavy work eat more and are therefore exposed to more carcinogens in their food.

4623 CHOLELITHIASIS AND CHRONIC GASTRITIS. *(Ger.)* Wolff, G. (Cancer Res. Inst., German Acad. Sci., Berlin, Germany) and H. J. Gütz. *Z Gastroent* 6(2):121-123, 1968.

Morbidity from chronic gastritis and cholelithiasis was studied by stomach biopsy and X-ray of the biliary tract in 190 patients; (78 men and 112 women) with upper abdominal complaints. Gallstones were present in only 69. Normal mucosa was found in 28% of those with gallstones, superficial gastritis in 32% and chronic gastritis in 46%. The increase in incidence of gallstones in conjunction with the intensity of gastritis was statistically significant. Laparoscopy and/or liver biopsies were obtained from 26 patients, 19 of whom showed no liver malfunction or gallstones. Seven patients had chronic hepatitis or liver cirrhosis in addition to cholelithiasis. Chronic gastritis and cholelithiasis may have a common etiology even in the absence of abdominal complaints.

4624 POPULATION STUDIES IN PATIENTS WITH GASTRIC CANCER. *(E.)* Oszacki, J. (2nd Surg. Clin., Med. Acad., Krakow, Poland), H. Nosek and M. Lenczyk. *Acta Med Pol* 9(4):427-429, 1968.

Between 1952 and 1966 2939 patients with gastric cancer were seen. Of these, 1561 patients (53.1%) were operated upon and histologically confirmed, 24.6% were not operable, and 22.3% refused surgery. In the operated group 68.8% were male and 31.2% female. The mean age was 53.9 yr (54.1 for women and 53.7 for men). The types of resections performed were: total in 78 (11.3%), upper in 92 (13.4%) and subtotal in 517 (75.3%). Although total resections were more frequently performed, an earlier analysis of 5-yr results led to the conclusion that total resection does not benefit the patient; therefore, total resection is currently performed only in special situations. In the 687 resected cases 65.9% had metastases in the lymph nodes. The age curves of those with and without metastases were similar in shape: peaks were between the 50th and 60th yr. The blood types of the stomach cancer patients were compared with those of the general population of Krakow. The gastric cancer patients had a higher percentage of blood type A and a lower percentage of type O. The season of the year in which 944 patients with stomach cancer were born was compared with that of 698 ulcer patients. In the stomach cancer group most patients (30.6%) were born in the first quarter of the year; whereas, most of the ulcer patients (26.0%) were born in the fourth quarter.

4625 UPPER GASTROINTESTINAL HEMORRHAGE FOLLOWING EXCESSIVE INGESTION OF ALCOHOLIC BEVERAGES. *(Sp.)* Lucchini, A. (Sch. Med. U. Chile, Valparaiso), H. Aste and L. A. Medina. *Rev Med Chile* 96(9):582-586, 1968.

Radiological and other studies were performed on 87 chronic alcoholics (defined as those taking at least 1 liter of wine or its equivalent in alcohol daily) who had gastric bleeding. Gastric biopsies were obtained in 58 patients. Most diagnostic procedures were performed before the 10th day of bleeding. Hemorrhagic gastritis was found in 37 patients (35 men and 2 women). All 50 patients without hemorrhagic gastritis were men. Of the 37 patients 32 had hematemesis and melena and 5 melena only. Of the 50 without hemorrhagic gastritis, a possible source of the bleeding was found in 21 and no bleeding 29. Two patients died from hemorrhage. There was a poor correlation between the endoscopic and the histologic findings. Prompt radiological and gastroscopic studies are essential in the diagnosis and treatment of hemorrhage.

4626 ROENTGENOLOGICAL PICTURE OF THE GASTROINTESTINAL TRACT FOLLOWING REPEATED RECONSTRUCTIVE OPERATIONS ON THE STOMACH. *(Rus.)* Sivash, E. S. (S. P. Botkin Clin. Hosp., Moscow, USSR). *Vestn Rentgen Radiol* 43(1):13-20, 1968.

A radiological study was carried out in 90 patients who had undergone repeated reconstructive surgery on the stomach. Of these 65 had had gastrojejunoduodenoplasty (Petrushinskii, 35; Zakharov-Henley, 30); 19 had reconstructive gastroenterostomies (Billroth I, 9; Hofmeister's operation, 10); 6 had undergone other reconstructive surgery. X-ray showed 3 different pictures after the Petrushinskii procedure of gastrojejunoduodenoplasty: 1) with complete stenosis evacuation proceeded rhythmically through the intestinal segment and the duodenum (rare); 2) with recanalization of the lumen of the distal loop, the contrast media in the intestinal segment moved through the duodenum and then directly into the small intestine; 3) occasionally there was a double recanalization of the lumen of the proximal and distal loops. After reconstructive gastrojejunoduodenoplasty using the Zakharov-Henley procedure physiological flow of the contrast medium was reestablished and to a certain degree a reservoir function was established. The evacuation-motor activity of the gastrointestinal tract was almost normal. After the Billroth I operation and after the Hofmeister's operation X-ray findings were similar to those following primary stomach surgery.

4627 **5-FLUORURACIL THERAPY OF CANCER OF THE STOMACH.** *(E.)* Blokhina, N. G. (USSR Acad. Med. Sci., Moscow). *Acta Med Pol* 9(4):407-415, 1968.

Advanced gastric cancer in 250 patients was treated with 5-fluorouracil. The compound was given on alternate days to lessen the known cumulative toxic effects. Each dose was calculated in terms of 15 mg per kg body weight; however, dosages of 0.75-1.50 mg/kg were used. The total dose for a course of treatment ranged from 3 to 7 mg. Since the response and adverse effects vary, the dosage must be individualized. Side effects were: diarrhea in 44.4%; stomatitis in 19.6%; leukopenia (below 3000/liter mm^3) in 12.5%. The patients treated were in the fourth stage of confirmed cancer. or with recurrences. Many had surgery for cure or palliation; some with distant metastases were inoperable. Treatment with 5-fluorouracil was more effective in primary tumors than in the metastases. (The sites of the metastases also were variably sensitive: liver was more sensitive than lymph nodes.) Some positive objective effects (regression of a cancer in the stump of the stomach) are illustrated with radiographs. Good results were obtained in 50% of the cases.

4628 **END RESULTS OF TREATMENT OF GASTRIC CANCER PATIENTS IN THE PROF. N. N. PETROV RESEARCH INSTITUTE.** *(E.)* Litvinova, E. V. (Inst. Oncol., Minist. Publ. Hlth., Leningrad, Russia). *Acta Med Pol* 9(4):439-442, 1968.

Gastric cancer ranks third after cervix uteri and breast cancer among the 29,891 cases of cancer at all sites observed during 40 yr at the Petrov Research Institute. Gastric cancer accounted for 5161 cases (17.3% of the total). Only 41.5% of the cases were operable. The overall operative mortality during the last 5-yr period was 7.3% and 3.4% after subtotal resection. Almost all of the surgically treated patients were available for follow-up; 32.7% survived 5 yr or more. The 5-yr survival rate for patients without regional lymph node metastases and treated by surgery was 44.8%. Whereas, the survival rate of patients with lymph node metastases was 20%.

4629 **GASTRIC ARTERIOSCLEROSIS IN ELDERLY PEOPLE.** *(E.)* Larsen, E. (Bispebjerg Hosp., Copenhagen, Denmark), A. Johansen and D. Andersen. *Scand J Gastroent* 4(4):387-389, 1969.

The occurrence and degree of arteriosclerosis in the gastric arteries in elderly patients with generalized arteriosclerosis was evaluated in 103 autopsies of patients over the age of 60. Significant arteriosclerosis in the gastric vessels was present in 9, compared with arteriosclerosis in the coronary arteries in 89. Gastric arteriosclerosis is rare even in patients over 60 with a high rate of arteriosclerosis in extragastric vessels. Gastric arteriosclerosis for the course of gastroduodenal hemorrhage in old age is questioned.

4630 **A GASTRECTOMY IN A PATIENT WITH MODERATE HYPOPROCONVERTINEMIA.** *(Fr.)* Gaveau, T. (Paris, France), M. Samama and G. Duvernay. *Anesth Analg (Paris)* 25(5):475-478, 1968.

A case report is presented of an ulcer patient (male, 35 yr old) with no history of hemorrhage or hepatic alterations. Examinations preceding the gastrectomy revealed an abnormal Quick test result due to a Factor VII deficiency (30% of the normal). The operation was performed, under protection of PPSB (seven 10 ml ampules) of a synthetic blood substitute). Hemorrhage was compensated by 900 ml of blood during and after the operation. Two days after the operation, the patient received 30 ml of plasma at 8 and 20 hr, and 30 ml of PPSB at 14 hr. After 5 days the proconvertinemia was at 35%, resulting in a partial biological correction.

4631 **RADIOLOGICAL PICTURE OF THE STOMACH AFTER GASTRODUODENOSTOMY AND SIMULTANEOUS VAGOTOMY.** *(Rus.)* Zhegin, V. A. (Yaroslavl Med. Inst., USSR). *Vestn Rentgen Radiol* 43(1): 21-25, 1968.

Radiological examinations were made before and at various intervals after gastroduodenostomy and vagotomy on 46 patients (37 with duodenal ulcers and 9 with decompensated ulcerative stenosis of the pyloroduodenal region). In 11 cases gastroduodenostomy was combined with subdiaphragmatic vagotomy of the gastric branches of the vagus nerve, in 9 cases with Burge's vagotomy, in 6 cases with complete unilateral and in 20 cases with complete bilateral vagotomy. In the first few weeks after surgery all patients had gastric enlargement; reduced gastric tonus and peristalsis; delayed emptying; and an increase in gastric fluid and mucus. The duodenum and proximal jejunum were enlarged, hypotonic, and the mucosal relief was abnormal. The movement of barium suspensions through the small intestine was slowed down. These changes are attributed to vagotomy. Gastric size and motility were almost normal 3-6 months after surgery, but the mucosal relief remained abnormal. The duodenal bulb was not seen and the antrum was shortened and displaced down and to the right. Three patients had an "hourglass" stomach; their gastric secretion was the same as before surgery and insulin tests were positive. However, the persistence and gradual accentuation of this deformation suggests that it is caused by scarring and not by incomplete vagotomy in which branches innervating the antrum remained intact. Follow-ups of 45 patients, 1-2 yr after surgery, showed that gastric motility had returned to normal. After 4 yr only 1 patient had delayed gastric emptying caused by progressive cicatricial stenosis of the pyloroduodenal region. Only 2 of 44 patients developed recurrent ulcers 6 months and 1 yr, resp., after surgery.

4632 **STUDY OF THE DISTRIBUTION OF GASTRIC ARTERIES. PART II: SURGICAL INCIDENCE.** *(Fr.)* Levasseur, J. C. (Res. Ctr. Abdominal Digestive Surg., Paris, France) and C. Couinaud. *J Chir (Paris)* 95(2):161-176, 1968.

A study of 30 plastic injections and 25 cadaveric arteriographies confirmed the existence of specific zones branching from the main gastric arteries. The functional importance of these vessels varies and is not proportional to their diameter: the coronary artery of the stomach is the most effective, with a smaller diameter than the splenic artery. The large stomach coronary area is well anastomosed with the splenic area, mainly by its tuberous anterior cardioesophageal branch. The right gastro-epiploic area is always well anastomosed with the stomach coronary area by its transverse corporeal branches. The splenic area and the gastro-epiploic area are poorly anastomosed to each other. The anastomotic extra-gastric arcades of the curvatures are important; mainly the large curvature arcade, found in 65% of the cases, with a marked diameter in 37% of the cases. A study of the stomach coronary implantation point in the lesser curvature, and the point of origin of the anterior tuberous cardia and short vessels, may decrease the risk of ischemia in a subtotal gastrectomy.

4633 **CHRONIC LYMPHATIC LEUKEMIA OF THE STOMACH: ITS SURGICAL TREATMENT.** *(Fr.)* Goudemand, M. (Calmette Hosp., Lille, France), R. P. Buffin, M. Leduc, G. Toison and Y. Delmas-Marsalet. *Lille Med* 14(1):49-53, 1969.

4634 **GASTROESOPHAGEAL PAIN AND MODERN THERAPY.** *(Fr.)* Monges, H. (North. Hosp., Marseille, France) and A. Hancy. *Sem Ther* 43(10):605-607, 1967.

4635 **STOMACH CANCER: A STATISTICAL REVIEW OF 186 CASES.** *(Gr.)* Kyparissiades, P. Agios Savvas Hosp., Greek Anticancer Inst., Athens) and D. Kelekis. *Galenus* 9(10):648-657, 1967.

4636 **CICATRICIAL PYLORIC STENOSIS AFTER CHEMICAL BURNS IN A 22-MONTH-OLD CHILD.** *(Rus.)* Baidalinov, V. P. (1st Semashko Munic. Hosp., Tula, USSR) and V. N. Noritsyn. *Vestn Khir Grekov* 99(8): 107-108, 1967.

4637 **MYCOSIS OF THE STOMACH.** *(E.)* Ahnlund, H. O. (Cent. Hosp., Nörrkoping, Sweden), B. Pallin and J. Schönebeck. *Acta Chir Scand* 133(7):555-562, 1967.

4638 **A CASE REPORT OF CONGENITAL PARTIAL SITUS INVERSUS OF UPPER GASTROINTESTINAL TRACT.** *(E.)* Cho, J. T. (Capital Army Hosp., Korea), C. U. Kim, Y. H. Shin, C. W. Ha and K. H. Yang. *Korean J Int Med* 11(10):655-658, 1968.

4639 **TREATMENT OF LOWER-SEGMENT GASTRIC ECTASIA WITH A DOUBLE FOLD OF THE ANTERIOR WALL OF THE LESSER TUBEROSITY AND THE BODY OF THE STOMACH.** *(Por.)* Mammana, C. Z. (Fac. Med. Sci., Santa Casa, São Paulo, Brazil). *Folha Med* 57(5):719-729, 1968.

4640 **A NEW OPERATION FOR CORRECTING CONGENITAL HYPERTROPHIC PYLORIC STENOSIS.** *(Rus.)* Toidze, N. T. (Cent. Hosp., Makharadzevskii Region, Georgian SSR). *Eksp Khir Anest* 13(3):37-39, 1968.

4641 ***IN VIVO* STUDY OF THE LYMPH IN THE THORACIC DUCT IN PATIENTS WITH GASTRIC CANCER.** *(Rus.)* Tatkalo, I. V. (Erevan Inst. Postgrad. Med., USSR), G. A. Arzumanian and K. G. Khandzhian. *Eksp Khir Anest* 13(4):28-32, 1968.

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4643 **SURVIVAL OF INOPERABLE PATIENTS WITH STOMACH CANCER.** *(Rus.)* Cherniavskii, A. A. (S. M. Kirov Med. Inst., Gorki, USSR) and P. A. Sveshnikov. *Vop Onkol* 14(10):93-96, 1968.

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4646 **THE EFFECT OF PARTIAL GASTRECTOMY FOR PEPTIC ULCER ON THE FREE HYDROCHLORIC ACID SECRETION.** *(Pol.)* Szklanny, J. (2nd Surg. Clin., Acad. Med., Łódź, Poland). *Pol Przegl Chir* 40(11): 1370-1374, 1968.

4647 **CONSEQUENCES OF GASTRIC SURGERY FOR THE GENERAL PRACTITIONER.** *(Fr.)* De Muylder, C. (St. Pierre U. Clin., Louvain, France). *Louvain Med* 87(10):711-715, 1968.

4648 **THE EFFECT OF METOCLOPRAMIDE ON THE MOTOR ACTIVITY OF THE GASTRIC ANTRUM.** *(Fr.)* Boccardo, J. J. (Fac. Med., U. Montevideo, Uruguay) and J. Ferras. *Sem Ther* 44(5):317-320, 1968.

4649 **A SIMPLE AND PROMISING TECHNIQUE OF CLOSING THE DUODENAL STUMP IN GASTRIC RESECTIONS PERFORMED ACCORDING TO BILLROTH II.** *(Rus.)* Telkov, N. A. (Med. Inst., Semipalatinsk USSR) and P. I. Kakenova. *Klin Khir (Kiev)* (12):26-28, 1968.

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4651 **GRANULOMATOUS GASTRITIS UNDERGOING RAPID CHANGE IN A BANTU.** *(Fr.)* Parmentier, R. (Pathol. Anat. Lab., Free U. Brussels, Belgium), S. Roc, F. Humeau and P. Demeester. *Acta Gastroent Belg* 32(4-5):353-364, 1969.

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4653 **A CASE OF DUPLICATION OF THE STOMACH.** *(It.)* Bardini, T. (Pediat. Clin., U. Turin, Italy), T. Gajno and S. Cocuzza. *Minerva Pediat* 21(28):1294-1298, 1969.

STOMACH

4654 LEIOMYOSARCOMA OF THE STOMACH. *(E.)* Taylor, P. H. (Luton and Dunstable Hosp., England). *Brit J Surg* 56(3):187-192, 1969.

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4656 HYPOCHLORHYDRIA, ACHLORHYDRIA AND ACHYLIA IN CLINICAL MEDICINE. *(Sp.)* Ginesta, J. R. (Dept. Med., Buenos Aires, Argentina). *Prensa Med Argent* 56(3):135-141, 1969.

4657 EPIDEMIOLOGICAL STUDIES OF STOMACH CANCER. *(Jap.)* Shichijo, K., A. Nakamura, Y. Tsukada, T. Higuchi, Y. Iijima, J. Kobayashi and H. Sutô. *Jap J Cancer Clin* 13(11):1040-1052, 1967.

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4659 CLINICAL AND HISTOLOGICAL STUDIES ON THE PROGNOSIS OF GASTRIC CANCER IN OSAKA KOSEINENKIN HOSPITAL. *(Jap.)* Murakami, E., T. Nagatomo, K. Hori, N. Asano, T. Shirai, T. Kurose, S. Bito, S. Sakaki, J. Yoshioka, S. Mizuno and H. Taketani. *Jap J Cancer Clin* 13(12):1094-1103, 1967.

4660 COEXISTENCE OF CHORIONEPITHELIOMA AND ADENOCARCINOMA IN THE STOMACH OF A MALE ADULT. *(Jap.)* Tanaka, S., Y. Sato, K. Sakoda and Y. Arima. *Jap J Cancer Clin* 13(10):921-927, 1967.

4661 URETERAL METASTASIS TO GASTRIC CARCINOMA. *(Jap.)* Kato, R., K. Hachisuka, M. Tomiyasu, K. Ishikawa, M. Murase and K. Tamoto. *Jap J Cancer Clin* 13(12):1136-1138, 1967.

4662 A CASE OF DOUBLE MALIGNANCIES OF THE STOMACH: COEXISTENCE OF HUGE LEIOMYOSARCOMA AND ADJACENT EARLY STAGE OF ADENOCARCINOMA. *(Jap.)* Futonaka, H., H. Toyoshima, Y. Omi, M. Inoue, Y. Takahashi, N. Tanaka, S. Tsunakawa and H. Suzuki. *Jap J Cancer Clin* 13(12):1127-1132, 1967.

4663 CLINICAL-PATHOLOGICAL ANALYSIS OF EARLY CARCINOMA OF THE STOMACH: SUPERFICIAL SPREADING TYPE AND PENETRATING GROWTH TYPE. *(Jap.)* Inokuchi, K., M. Furusawa, K. Soejima, Y. Sannoe, K. Abe, T. Ikeda, Y. Tanaka, S. Kawasaki, R. Okamoto and T. Saito. *Jap J Cancer Clin* 13(11):1017-1024, 1967.

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4665 SURGICAL EXPERIENCE OF THREE CASES WITH PERFORATED CANCER OF THE STOMACH AND STATISTICAL OBSERVATION WITH THESE CASES IN JAPAN. *(Jap.)* Sawano, N., M. Takahashi, Y. Miyazaki, Y. Mitomo, N. Endo, S. Kusaka, K. Saito, O. Kaneta and S. Fukuta. *Jap J Cancer Clin* 13(10):947-954, 1967.

4666 TWO CASES OF PRIMARY DOUBLE TUMORS OF STOMACH INVOLVING THE LUNG AND UTERUS. *(Jap.)* Urushizaki, I., T. Sasaki, M. Fukuda, J. Ibayashi, T. Nakasato and K. Muroya. *Jap J Cancer Clin* 13(10):959-964, 1967.

4667 THE COMBINED GASTRECTOMIES. *(Rus.)* Telkov, N. A. (Semipalatinsk Med. Inst., USSR). *Vestn Khir Grekov* 99(9):58-60, 1967.

4668 A CASE OF MULTIPLE PRIMARY CARCINOMA: ADENOCARCINOMA IN THE STOMACH AND SQUAMOUS CELL CARCINOMA IN THE UTERUS. *(Jap.)* Hayakawa, S., K. Funaki, T. Yamashita, K. Sato and K. Kudo. *Jap J Cancer Clin* 13(9):710-713, 1967.

4669 THE PROGNOSIS OF STOMACH CANCER AFTER RADICAL SURGERY AT THE CANCER INSTITUTE HOSPITAL EVALUATED ACCORDING TO THE STANDARDS OF THE JAPANESE RESEARCH SOCIETY FOR GASTRIC CANCER. *(Jap.)* Nishi, M., M. Nakamura, Y. Hishida, T. Yamanobe, K. Gotoda, M. Iwabuchi, T. Akiyama and I. Kinoshita. *Jap J Cancer Clin* 13(7):491-501, 1967.

4670 GASTRIC CARCINOMA IN YOUTH. *(Jap.)* Uegaki, K. *Jap J Cancer Clin* 13(6):424-427, 1967.

4671 A CASE OF MULTIPLE VOLVULUS OF THE MAJOR OMENTUM. *(Pol.)* Fijuth, B. (2nd Cent. Hosp. Clin., Warsaw Acad. Med., Poland) and E. Stanowski. *Wiad Lek* 20(18):1737-1739, 1967.

4672 GASTRITIS HAEMORRHAGICA. *(E.)* Fock, G. (U. Cent. Hosp., Helsinki, Finland). *Ann Chir Gynaec Fenn* 56(2):202-205, 1967.

See also: 4274,4305,4330,4356,4358,4367,4370,4371,4383,4492,4543,4550,4553,4571,4576,4584,4585,4590,4593, 4606,4725,4726,4842,4843,4859

SMALL INTESTINE

4673 CONSTRICTION OF THE GASTROJEJUNOSTOMY AND SUBMESOCOLIC DUODENAL TRANSPOSITION OF THE EFFERENT LOOP IN THE DUMPING SYNDROME.

(It.) Grassi, G. (Ospedali Riuniti, Rome, Italy) and E. Fivoli. *Chir Gastroent* 2(2):225-229, 1968.

Two variations in the technique of Henley-Soupault-Bucaille for the surgical treatment of the dumping syndrome are presented. The steps are: incision of the mesocolon, and, thru it, isolation and return of the higher portion of the submesocolic duodenum. Incision of a section of the efferent jejunal side, from the stomach to the efferent loop. Just below it, resection of the funnel-like tract of the efferent side of the stoma; its anastomosis with the distal part of the efferent loop. Suture of the wound of the gastrojejunal section and its depression to obtain a longitudinal constriction of the initial part of the jejunum for a length of 2-3 cm. A vagotomy was associated; the mobilized mesocolon was reconstituted. This variant technique is possible only if the previous gastrojejunal anastomosis was transmesocolic, so vascular lesions can be avoided.

4674 EXPERIMENTAL STUDY AND CLINICAL APPLICATIONS OF INTESTINAL ANSAE INVERSION.

(Fr.) Weiss, A. G. (C. H. U., Strasbourg, France), J. F. Grenier, G. Sava and R. Grevoisier. *Bull Acad Nat Med* 152(11/12):198-207, 1968.

Three series of experiments were performed in dogs. In the first series the proximal or the distal part of the small intestine (66-80%) was resected. Results indicated a weight loss of 10-15% with recovery after 3 months for the distal resection, and 15-20% without recovery after proximal resection. The proximal resection inhibited the absorption of neutral fats and of fatty acids by 45%; the distal resection inhibited only the absorption of neutral fats by 45%. An acceleration of the intestinal transit was produced. In the second series the inversion of an intestinal segment was associated with a massive resection. Results indicated a wide compensation of the nutritional deficiency; imporvement of fat absorption; and slower intestinal transit. In the third series a massive intestinal resection with ablation of the ileocecal valve was performed: 50% of the dogs with ablated valve and 80% of the dogs with a resectioned small intestine survived more than 1 yr. These procedures were used on 3 patients with chronic diarrhea associated with an accelerated intestinal transit. In the first case an inversion of the intestinal segment of 9.5 cm was associated with a resection of 50 cm of the ileum; no etiology was determined. In the second patient an intestinal inversion of 12.5 cm was performed; the diarrhea was caused by a resection of the ileocecal junction. In the third case the diarrhea was caused by an abnormal brevity of the small intestine; an inversion of 12 cm was performed. Diarrhea was corrected in all cases and the body weight increased or remained the same.

4675 SMALL BOWEL ULCERATION. AN EVALUATION OF THIAZIDE THERAPY.

(E.) Hentzer, L. (Geriatric Ctr., Copenhagen, Denmark) and I. Persson. *Geriatrics* 23(1):161-163, 1968.

The 71 patients studied (53 females, 17 males) ranged in age from 68-93 yr (average 82 yr). They had been under continuous treatment for noncompensated arteriosclerotic heart disease receiving daily 2 tablets containing 2.5 mg bendroflumethiazide and 573 mg potassium chloride with an enteric-coated potassium chloride core. The tablets had been given for periods ranging from 2 weeks to 48 months (average 16 months). After a 4-day meatless diet, 5-6 consecutive stool specimens were taken while the diet was continued. The stools were examined for blood using Gregersen's benzidine method. All patients were then treated for 6 weeks with the same dose of the agent with supplements of potassium-containing fruit (e.g., bananas, orange juice). After a meatless-diet the stools were reexamined. The patients were then given the same agents but with a sustained-release potassium chloride core instead of the enteric-coated potassium chloride core. The total observation period was 18 weeks. Liver function tests, proctoscopic examination, and rectal examinations were carried out on all patients. All females received a gynecological examination. Stomach and colon X-rays were taken. Serum sodium, potassium, and chloride determinations were made weekly. Medication not causing hemorrhage to the gastrointestinal tract (e.g., digitalis or mild laxative) was continued during the period. The fact that aspirin can cause hemorrhage of the gastrointestinal canal and diverticula of the colon was taken into account and results are given for all patients (71) and those without diverticula and hemorrhage (45). The number and percent of patients with one or more positive benzidine reactions were: for thiazide with eneteric-coated core 38 (54%); for thiazide alone 25 (35%), and for thiazide with sustained-release core 19 (27%). For the 45 patients without diverticula or hemorrhage the results were 19 (42%) for the agent with enteric-coated core, 13 (29%) for the agent alone, and 11 (24%) for the agent with the sustained-release core. The distribution of benzidine reactions in each patient and the benzidine reactions in all stools examined are reported in tables.

4676 PITFALLS IN THE SURGICAL MANAGEMENT OF THE INCOMPLETE DUODENAL DIAPHRAGM.

(E.) Richardson, W. R. (Coll. Med., U. Cincinnati, Ohio) and L. W. Martin. *J Pediat Surg* 4(3):303-312, 1969.

A review of 21 patients with a diaphragmatic type of duodenal stenosis showed that ages ranged from 1 day to 12 yr; that 6 were operated upon in the first week of life, 10 in the first month, and 13 in the first year. Clinically, the preoperative diagnosis was duodenal diaphragm in 10, stenosis in 7, malrotation in 3 and anastomotic dysfunction in 1. Plain 3-dimensional abdominal roentgenograms showed a "double-bubble" in every instance, but it was not always considered diagnostic. Seven of the 21 were mongoloid. Anomalies included anomalous rotation of the colon or duodenum in 5, hiatal hernia in 2, congenital heart disease in 2, Meckel's diverticulum, situs inversus, and nonobstructive annular pancreas in 1 each. Two patients proved to have 2 separate duodenal diaphragms and the sibling of 1 had died from a similar double lesion 8 yr before. In 14 patients the aperture size was specified and ranged from pinpoint to more than 1.0 cm (average 5-6 mm), and only roughly correlated with age. Eleven of the 23 lesions were confirmed as windsock configuration and indirect evidence suggested more. Bypass procedures were used 9 times but the direct approach is favored.

4677 **A SUCCESSFULLY TREATED CASE OF INTESTINAL OBSTRUCTION RESULTING FROM MECKEL'S DIVERTICULUM.** *(Jap.)* Morita, K. (Nihon U. Sch. Med., Tokyo, Japan), I. Okabe, H. Okamura and S. Sunaga. *Nichidai Igaku Z* 27(1):71-75, 1968.

4678 **NUTRIENT SUPPLY AND ENZYME ACTIVITY OF THE SMALL INTESTINE DURING PNEUMONIA IN YOUNG CHILDREN.** *(Rus.)* Panchenko, V. I. (Buiko Pediat. Obstet. Gynec. Sci. Res. Inst., Kiev, USSR). *Pediatriia* 47(11):55-58, 1968.

4679 **LEIOMYOMA OF THE SMALL INTESTINE CAUSING ILEUS AND MELENA.** *(Cz.)* Vlasak, V. (Fac. Hyg., Charles U., Prague, Czechoslovakia). *Cesk Pediat* 23(10):546-550, 1968.

4680 **CHRONIC BLEEDING FROM THE INTESTINAL TRACT CAUSED BY DUPLICATION OF THE ILEUM IN A 14-YEAR-OLD BOY.** *(Pol.)* Jarosik N. (Child. Clin. Surg., Acad. Med. Łódź, Poland), B. Lamentowska and K. Błaszyńska-Nawrocka. *Wiad Lek* 21(22):2055-2058, 1968.

4681 **PROFUSE HEMORRHAGE DUE TO A TUMOR OF THE DUODENUM.** *(Pol.)* Kompf, A. (1st Surg. Clin., Acad. Med. Poznań, Poland), J. Aniszczenko and M. Napierala. *Pol Przegl Chir* 40(11):1394-1395, 1968.

4682 **RADIOLOGY IN MECONIUM ILEUS.** *(Fr.)* Du Bois, R. (U. Hosp. Ctr., Lille, France), J. Rémy, P. Debeugny, J. P. Maillard and S. Moyon. *Pediatrie* 23(3): 283-294, 1968.

4683 **INTERNAL STRICTURE OF THE SMALL INTESTINE IN A DEFECT OF THE GASTROCOLIC LIGAMENT.** *(Rus.)* Serniak, P. S. (Donetsk Med. Inst., USSR), V. V. Minin and E. P. Kriukova. *Klin Khir (Kiev)* (5):60, 1968.

4684 **INTRALUMINAL DIVERTICULUM OF THE DUODENUM.** *(It.)* Piazza, G. (Inst. Radiol., U. Padua, Italy) and F. Bidoli. *Arch Ital Mal Appar Dig* 35(3): 262-270, 1968.

4685 **A CASE OF SMALL INTESTINE ATRESIA RESULTING FROM INTRAUTERINE INTESTINAL VOLVULUS.** *(Dut.)* Van Damme, J. P. (St. Joseph Clin., Bruges, Belgium) and R. Maenhoudt. *Acta Chir Belg* (Suppl. 2): 112-119, 1967.

4686 **CHANGES IN THE INTESTINAL FLORA AFTER RESECTIONS AND BYPASS-OPERATIONS ON THE SMALL INTESTINE IN RATS. THE EFFECT OF DIFFERENT TYPES OF ANASTOMOSIS.** *(E.)* Nygaard, K. (Inst. Pathol. Anat., U. Oslo, Norway). *Acta Chir Scand* 133(7):569-583, 1967.

4687 **INTESTINAL OCCLUSION DUE TO POST-TRAUMATIC INTRAMURAL HEMATOMA.** *(It.)* Giugiaro, A. (Inst. Radiol., U. Turin, Italy) and E. Grassi. *Minerva Pediat* 19(27):1505-1511, 1967.

4688 **LEIOMYOMA OF THE AMPULLA OF VATER AS THE CAUSE OF MASSIVE RECURRENT BLEEDING.** *(Dut.)* Timmermans, G. *Acta Chir Belg* (Suppl. 2):99-111, 1967.

4689 **ENZYME FUNCTION IN THE SMALL INTESTINE IN YOUNG CHILDREN SUFFERING FROM ANEMIA.** *(Rus.)* Bayandina, S. A. (1st Moscow Med. Inst., USSR), G. D. Chernobylskaia and S. Ya. Mikhlin. *Pediatriia* 46(8):13-16, 1967.

4690 **ACUTE DIVERTICULITIS OF THE SMALL INTESTINE.** *(Rus.)* Zemlyanoi, A. G. (S. M. Kirov Inst. Postgrad. Med., Leningrad, USSR). *Vestn Khir Grekov* 99(8):64-66, 1967.

4691 **DUODENAL EPITHELIOMAS: REPORT OF 9 CASES.** *(Fr.)* Merveille, P., J. C. Paris and J. Paris. *Lille Med* 14(1):13-18, 1969.

4692 **ILEAL OBSTRUCTION DUE TO ADHESIONS AND PHYTOBEZOAR FOLLOWING GASTRECTOMY. REPORT OF A CASE.** *(E.)* Herschman, A. (Long Island Jewish Hosp., New Hyde Park, N. Y.). *Radiology* 92(6):1307-1308, 1969.

4693 **CONTRIBUTION TO THE PROBLEM OF JEJUNOSTOMY IN CLINICAL PRACTICE.** *(Cz.)* Potrusil, B. (Med. Fac., Purkyne U., Brno, Czechoslovakia) and J. Uhlíř. *Cesk Gastroent Vyz* 23(4):171-175, 1969.

4694 **LIPOMATOSIS OF THE ILEOCECAL VALVE.** *(Fr.)* Mainguet, P. (Brussels, Belgium), M. Arguello, H. Daled, E. Collard and A. Vanpeperstraet. *Acta Gastroent Belg* 32(4/5):377-382, 1969.

4695 **A HUGE DUODENAL DIVERTICULUM TREATED SURGICALLY.** *(Pol.)* Sokolowski, J., W. Owsiany. *Wiad Lek* 20(18):1733-1735, 1967.

4696 **UPPER GASTROINTESTINAL HEMORRHAGE DUE TO AORTO-DUODENAL FISTULA. A DELAYED COMPLICATION OF INTERPOSED ABDOMINAL PROSTHESES.** *(E.)* Wagner, M. (Marquette U. Sch. Med., Milwaukee, Wis.) and M. I. Hussain. *Vasc Dis* 4(6):329-334, 1967.

4697 **ARTERIOVENOUS MESENTERIC FISTULA AFTER PARTIAL RESECTION OF THE SMALL INTESTINE.** *(Fr.)* Warter, J. (U. Hosp. Ctr., Strasbourg, France), R. Kieny, B. Gillet, D. Storck, N. Hoffmann and J. P. Haberer. *Ann Med Intern (Paris)* 120(3):185-191, 1969.

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4698 **A PECULIAR CLINICAL AND RADIOLOGICAL PICTURE CAUSED BY PSEUDO-BILIARY ILEUS.** *(It.)* Manenti, W. (Circolo Merate Hosp., Italy) and U. Rusconi. *Osped Ital Chir* 17(6):689-692, 1967.

4699 **JEJUNAL DIVERICULITIS WITH ACUTE PERFORATION.** *(Rev.)(E.)* Vansant, J. A. (902 Med. Tower., Norfolk, Virginia). *Virginia Med Monthly* 96(7):392-396, 1969.

4700 **NODULAR LYMPHOID HYPERPLASIA OF THE SMALL INTESTINE AND HYPOGAMMAGLOBULINEMIA.** *(E.)* Penny, R. (Dept. Med., U. Sydney, New South Wales, Australia). *Gastroenterology* 56(5):982-985, 1969.

4701 **MANAGEMENT OF CHRONIC INFECTED INTESTINAL PERFORATIONS BY THE SEROSAL PATCH TECHNIC.** *(E.)* Jones, S. A. (Dept. Surg., U. Calif. Irvine) and R. A. Steedman. *Amer J Surg* 117(5):731-734, 1969.

4702 **ENDOMETRIOSIS OF SMALL INTESTINE. [CASE REPORT]** *(E.)* Bose, A. (Withington Hosp., Manchester, England) and J. Davson. *Brit J Surg* 56(2):109-111, 1969.

4703 **DUODENAL CARCINOMA.** *(E.)* Craig, O. (St. Mary's Hosp., London, England). *Brit J Surg* 56(1):39-44, 1969.

4704 **RUPTURE OF THE DUODENUM PRODUCED BY A SAFETY BELT.** *(E.)* Buxton, B. (Dept. Surg., U. Melbourne, Australia). *Aust New Zeal J Surg* 38(4):315-320, 1969.

4705 **A CASE OF RETROGRADE INVAGINATION OF THE SMALL INTESTINE INTO A BRAUN ANASTOMOSIS AND THE STOMACH.** *(Bul.)* Sakakushev, Ie. (Higher Med. Inst., Plovdiv, Bulgaria). *Khirurgiia (Sofiia)* 21(6):592-593, 1968.

4706 **ILEORECTAL ANASTOMOSIS WITH ILEAL LOOP.** *(Sp.)* Zavaleta, D. E. (Rawson Hosp., Buenos Aires, Argentina), J. M. Oglietti and A. Heidenreich. *Rev Asoc Med Argent* 82(10):405-407, 1968.

See also: 4307,4314,4345,4487,4547,4558,4591,4638,4848,5065,5080

4707 **THE IMPORTANCE OF GASTRIC SECRETION VOLUME IN THE DEVELOPMENT OF DUODENAL ULCER.** *(Sp.)* Meeroff, J. C. (Metropolitan Sanat., Federal Capitol, Argentina), J. A. Rofrano, N. Marchevsky and M. Meeroff. *Rev Esp Enferm Apar Dig* 27(10):1427-1434, 1968.

Studies were performed on 25 patients with duodenal ulcers to determine the volume of gastric secretion throughout the course of the disorder. Comparisons were made of concentration and volume in active and inactive stages of ulcer development. Results agree with past studies in that ulcer patients show no tendency toward decreased secretion during treatment. Ulcer activity produced a significant increase, at times by a factor of 2-3, in volume of gastric content; this is greatly reduced during periods of rest. Hydrogen ion concentration varies to a much lesser extent, as does concentration of Cl, Na and K ions. The reason for this is obscure. It may be due to the volume of gastric wall secretions. Whereas the increase is well established, no agreement has been reached as to its cause. It may have a genetic basis or be characteristic of some persons prior to ulcer development. The findings presented here would tend to favor an explanation based on secondary hyperphasis caused by prolonged nervous or dietetic hyperstimulation.

4708 **FATE OF THE RECTUM AND DISTAL COLON AFTER SUBTOTAL COLECTOMY FOR ULCERATIVE COLITIS.** *(E.)* Korelitz, B. I. (Mt. Sinai Sch. Med., New York, N. Y.), W. P. Dyck and F. M. Klion. *Gut* 10(3): 198-201, 1969.

Of 136 patients with ulcerative colitis treated by ileostomy and subtotal colectomy during a 12 yr period, 126 (94%) later underwent abdominoperineal resection, 40% within one yr and 90% within three yr. In 7 additional patients the rectal disease persisted. The remaining 3 had reanastomoses, only 1 without recurrence. The mortality rate following secondary abdominoperineal resection was 3%. One patient developed carcinoma in the rectal segment. Since the rectal segment involved with ulcerative colitis can rarely, if ever, be used for a successful reanastomosis after a subtotal colectomy, in most cases a primary total proctocolectomy is indicated.

4709 **LEAKAGE AT SUTURE LINES AFTER PARTIAL GASTRECTOMY FOR PEPTIC ULCER.** *(E.)* Pettersson, S. (Regionsjukhuset, Örebro, Sweden) and S. Wallensten. *Acta Chir Scand* 135(3):229-235, 1969.

A 30 yr review of 5315 partial gastrectomies performed for peptic ulcers revealed postoperative sutural insufficiency in 76 (36 after Billroth 11, 40 after Billroth 1) or 1.4% of Billroth 1 and Billroth II procedures. The indications for surgery included gastric ulcer (19), duodenal ulcer (43), both ulcers simultaneously (3), and gastroenterostomy ulcer following previous partial gastrectomy (11). Leakage appeared during the first week in 52 cases. In 20 (55%) of the 36 Billroth II patients the leak occurred at the invaginated duodenal stump. Twelve (30%) of the 40 Billroth I cases developed leaks in the anterior suture line of the gastroduodenostomy. Forty-four of the patients developed clear-cut peritonitis with a rapid onset, and 28 of these died. Nine of 13 patients with duodenal stump insufficiency survived after drainage procedures while none of those treated conservatively or with reclosure survived. Conservative therapy for a leak in a gastrointestinal anastomosis yielded poor results. Drainage, suture closure, and resection were comparable (> 30% success) and a choice of procedure depended on the extent of the leak, the condition of the patient and whether the insufficiency was walled off. Of 36 sutural insufficiencies after Billroth II resection 21 died (58%). Sixteen of 40 cases of leakage after Billroth 1 died. Mortality rates in both groups improved during the period under review from 85% in 1932-1949 to 40% in 1950-1962. Modern therapy of shock, control of fluid balance, improved anesthetic technique and accumulated surgical experience are believed accountable.

4710 **PERFORATED PEPTIC ULCER IN SOUTH WEST SCOTLAND.** *(E.)* Neilson, J. (Royal Infirm., Dumfries, Scotland). *J Roy Coll Surg (Edinb)* 13(1): 40-45, 1968.

In Dumfries and Galloway, predominantly rural areas, 590 peptic ulcer perforations occurred during 1946-1965 with an unexplained peak in 1952-1956. The incidence in Dumfries and Galloway was considerably lower than that in Glasgow and York, but similar to that in Aberdeen. Men suffered perforation much more than women: 12:1. Perforation was: 90% in the duodenum; more common in agricultural workers; occurred most commonly in December and was relatively uncommon in September and October. It occurred least frequently on a Sunday, and each succeeding day of the week showed an increase until a peak on Fridays. Tea-time was the preferred time of the day for perforation to occur, but lunch time was not uncommon. Most patients had simple closure of the perforation; however, many required further surgery for continued symptoms. The mortality rate was 6.9% (41 patients died). Mortality rate increased with age and with delaying of surgery. Perforation of a peptic ulcer may occur in a patient who is in a hospital for investigation: 7 patients who did perforate while in a hospital died.

4711 **A STUDY OF 433 PATIENTS OPERATED ON FOR GASTRODUODENAL ULCER.** *(It.)* Sassi, I. (Dept. Surg., U. Turin, Italy) and P. A. Rosso. *Minerva Chir* 23(2):88-92, 1968.

A study was made of the 455 patients treated by partial gastrectomy for gastroduodenal ulcers between January 1960 and December 1965. The Reichel-Polya procedure was used in most cases, but in 2 the Hoffmeister-Finsterer was employed. There were 43 (9.453%) women and 412 (90.547%) men in this study. Duodenal ulcers were in the first section of the duodenum in 360 cases (79.1%) and in the second segment in 9 (1.9%). Incidence of gastric ulcer was highest in men between the 3rd and the 5th decades while in women it was highest after the 5th decade. The mortality in the series was 1.5% (7 cases). The results were evaluated by interviews or questionnaire. The response was 70% (319 patients) to the interviews and 24.9% (114 patients) to the questionnaire. Questions were asked about weight gain, return to usual occupation, adherence to dietary regimens, alcohol, smoking, and reoperations. Excellent results were found in 353 patients (81.7%), good in 59 (13.6%), fair in 20 (4.7%) who had a slight disturbance of canalization associated with deficiency syndromes. In 2 of the operated patients there was edema of the stoma and in 2 others a dumping syndrome. There were protein imbalances in 81.1% of the cases hypochromemia in 30.9%.

4712 A STUDY OF POSTOPERATIVE JEJUNAL ULCERS.

(Sp.) Farfan Cantero, J. R. (Sao Lucas Sanatorium, Brazil). *An Paul Med Cir* 93(3):77-94, 1967.

Fifty eight cases of postoperative jejunal ulcer (of which 94.8% were in men) were studied. The peak age incidence (36.2%) was 31-40 yr. Jejunal ulcers were most frequent in patients who had undergone surgery for duodenal ulcers (65.5%). Postoperative jejunal ulcers were more frequent after gastroenterostomies than after extensive gastrectomies. Localization of the ulcers in the majority of cases (34.5%) was on the mesentery edge. Of the 58 patients studied, surgery for jejunal ulcers was performed on 48. Of the other 10 patients, 9 did not return in treatment after X-ray diagnosis, and the other one received drug treatment. The surgical techniques used in postoperative jejunal ulcers were: transthoracic vagotomy, gastrectomy, and jejunal resection.

4713 THE SURGICAL MANAGEMENT OF STRESS ULCERS.

(E.) Kirtley, J. A. (Vanderbilt U. Med. Ctr., Nashville, Tenn.), H. W. Scott, J. L. Sawyers, H. A. Graves Jr., and M. R. Lawler. *Ann Surg* 169(5):801-809, 1969.

The surgical management of 41 patients (31 males, 10 females) with an age range of 18 months to 83 yr who developed stress ulcers after major operations for disease (24), surgery for trauma (11), or traumatic injury (6) is discussed. Ten of the surgical patients had hepatic and biliary operations, another 4 had cardiovascular procedures. Severe upper gastrointestinal bleeding was the initial manifestation in all. Symptoms appeared on the average of 8 days after operation or trauma. Hypovolemic shock was more common among the patients who subsequently died. Twelve (29%) patients were septic before operation for their stress ulcer and 8 of these died. Gastric cooling was the initial treatment for these patients and for the survivors the time between symptoms and surgery was 7 hr. The time interval for those who died was 34 hr. At operation there were 21 patients with multiple gastric ulcers, 9 with single ulcers, 6 with solitary duodenal ulcers, and 2 with both gastric and duodenal ulceration. Twenty-five patients survived. Truncal vagotomy and pyloroplasty with suture of the bleeding site had a lower mortality (30%), than did vagotomy with partial gastric resection (60%) or simple suture of the bleeding site (50%). Rebleeding was not significantly different among the 3 types of operations.

4714 MASSIVE HEMORRHAGE FROM PEPTIC ULCER: EVALUATION OF METHODS OF SURGICAL CONTROL.

(E.) Conn, J. H. (U. Mississippi Med. Ctr., Jackson), J. D. Hardy, W. R. Fain and C. M. Chavez. *Ann Surg* 169(5):784-789, 1969.

The clinical course of 72 patients hospitalized and operated upon during a 5 yr period for life-threatening hemorrhage from benign gastric or duodenal ulcers was analyzed. There were 56 men and 16 women with an average age of over 50 (age range 20 to 78). There were 52 duodenal ulcers (operative mortality 17.3%) and 17 gastric ulcers (29.5% mortality). For 46 (63.8%) of the patients it was the first bleeding episode although 55 (76.3%) had had prior ulcer symptoms. Average total blood replacement was 9150 ml. More than three-quarters (76.3%) of the patients were operated on within 72 hr of the onset of bleeding. Subtotal gastric resection with or without vagotomy was performed in 36 patients with 6 deaths, 8 episodes of significant postoperative bleeding and 12 other postoperative complications including 6 fistulas. Vagotomy and pyloroplasty was performed in 27 patients with 4 deaths, 2 episodes of postoperative bleeding and 5 other significant postoperative bleeding and 5 other significant postoperative complications. A gastrotomy with oversewing or excision of the ulcer was performed in 6 patients with 4 deaths, 3 episodes of postoperative bleeding and 3 other major postoperative complications. Five patients bled again after discharge but only 2 significantly. The other 42 patients had good to excellent results from their operation.

4715 PREOPERATIVE GASTRIC SECRETION IN PATIENTS WITH GASTRIC OR DUODENAL ULCER.

(E.) Liavag, I. (Ullevål Sykehus, Oslo, Norway) and O. Havig. *Acta Chir Scand* 135(3):221-228, 1969.

Gastric secretion was studied preoperatively in 234 patients with gastric or duodenal ulcer. Secretory flow (volume) and maximal acid output (MAO) showed great individual variations. In men with duodenal ulcer the mean MAO was 32.37 mEq total acidity (TA) per hr, and the mean volume per hr after histamine stimulation was 306 ml. In women with duodenal ulcer the mean MAO was 24.79 mEq, and the mean secretory flow was 251 ml per hr. In men the highest mean output of acid was found in the age group 30-39 (36.21 mEq) while in women it was in the age group 50-59 (28.55 mEq). Both in men and women, however, the age groups showed no significant difference in acid production. No correlation was found between age and acid secretion in duodenal ulcer patients. The mean MAO for men with gastric ulcer was 18.94 mEq TA per hr, and the mean secretory flow per hr after histamine stimulation was 217 ml. In women the figures were 11.08 mEq and 152 ml per hr, resp. The difference between the values for MAO in men and women was highly significant. The mean MAO for men with gastric ulcer was significantly lower than the mean MAO for women with duodenal ulcer. No correlation was found between acid secretion and age in men or women with gastric ulcer. In women with a history of duodenal ulcer for 15 yr or more the mean MAO was significantly higher than in patients with symptoms for less than 15 yr. In men with a history of duodenal ulcer for 20 yr or more the mean MAO was slightly but not significantly higher than in patients with an ulcer history of less than 5 yr. In female patients with duodenal ulcer, weighing 60 kg or more, the mean MAO was significiantly higher than in patients weighing less. In men the results were inconclusive because few patients weighed less than 60 kg. No difference in acid secretion was found in patients weighing 60 kg or more. Six of the 112 male patients operated on for duodenal ulcer had recurrent ulceration. Four of these had an incomplete vagotomy. The other two patients, however, had a complete vagotomy, and the preoperative values for acid secretion were fairly normal.

4716 **ENVIRONMENTAL FACTORS AND THE AUSTRALIAN GASTRIC ULCER CHANGE.** *(E.)* Chapman, B. L. (Royal Newcastle Hosp., New South Wales, Australia) and J. M. Duggan. *Med J Aust* 1(23):1179-1183, 1969.

In a study of the excessive numbers of gastric ulcers in females (134 of 295 during a 6 yr period) in eastern Australia, steroids, phenylbutazone, alcohol, tobacco and aspects of social status and function were considered. Only 3 patients took steroids or phenylbutazone, all had duodenal ulcers, none was young. Sixty-six percent of males, but only 25% of females, drank alcohol. Eighty-three percent of males and 57% of females smoked. The same proportion of both sexes smoked moderate amounts, but heavy smokers were predominantly male. For males, heavy consumption of alcohol, tobacco and analgesics was interrelated. Heavy usage of aspirin was, for woman, correlated with smoking. Partially and completely unskilled classes accounted for 60% of cases. An abundance of males with duodenal ulcers occurred in skilled classes and a deficiency in the unskilled group. Of males in semi-skilled and unskilled occupations, 90% smoked, compared with 72% among professional and skilled workers. Consumption of aspirin and alcohol was independent of social class. Forty-six percent were socially incompetent. Although fewer males in the upper than in the lower classes were incompetent, 50% of the females of all classes were. Thirteen percent of patients drew an invalid repatriation pension. Only social class was related to the site of the ulcer, and this was to duodenal ulcer in males. None was related to gastric ulcer in females. Heavy aspirin consumption alone appeared to be the cause of excessive gastric ulcers in females.

4717 **HEMORRHAGIC CAPILLARY TOXICOSIS COMBINED WITH GASTRIC ULCERS COMPLICATED BY BLEEDING.** *(Rus.)* Zhevnov, V. N. (1st Region. Hosp., Gomel', USSR) and V. F. Pod"elets. *Klin Khir (Kiev)* (12):73, 1968.

4718 **INDICATIONS FOR PHYSIOLOGICAL SURGICAL PROCEDURES WITHOUT RESECTION IN THE TREATMENT OF PEPTIC ULCERS.** *(Ger.)* Koch, W. (Marien Hosp., Hamburg, Germany). *Hippokrates* 39(23):889-893, 1968.

4719 **ENDOGENOUS FACTORS IN THE INCEPTION OF THE ULCEROUS DISEASE.** *(E.)* Kubickova, Z. (Inst. Hematol. Blood Transfus., Prague, Czechoslovakia), M. Dvorakova and K. T. Veselý. *Plzen Lek Sborn* (Suppl. 22): 175-177, 1968.

4720 **A CONTRIBUTION TO THE GENETIC PROBLEMS OF ULCER DISEASE.** *(E.)* Jirásek, V. (Pediat. Fac. Charles U., Prague, Czechoslovakia), M. Černý and O. Gregor. *Plzen Lek Sborn* (Suppl. 22):161-167, 1968.

4721 **PARTICIPATION OF GENETIC AND NON-GENETIC FACTORS IN THE AETIOPATHOGENESIS OF PEPTIC ULCERATION.** *(E.)* Veselý, K. T. (Inst. Hum. Nutr., Prague, Czechoslovakia) and Z. Kubíčková. *Plzen Lek Sborn* (Suppl. 22):169-173, 1968.

4722 **MASSIVELY BLEEDING PEPTIC ULCER.** *(E.)* Fock, G. (U. Cent. Hosp., Helsinki Finland) and K. Asp. *Ann Chir Gynaec Fenn* 57(1):34-39, 1968.

4723 **CLINICAL EXPERIENCES WITH SELECTIVE VAGOTOMY.** *(E.)* Scheinin, T. M. (U. Turku, Finland) and M. V. Inberg. *Acta Chir Scand* 133(7):533-537, 1967.

4724 **ACID-PEPTIC DIGESTION OF THE INTESTINAL MUCOSA.** *(E.)* Crispin, J. S. (U. Kentucky Med. Sch., Lexington) and W. O. Griffen, Jr. *J Surg Res* 7(12):556-559, 1967.

4725 **ACUTE MULTIPLE BLEEDING GASTRIC ULCERS.** *(Rus.)* Butenko, A. T. (5th Munic. Hosp., Zaporozhe, USSR). *Vestn Khir Grekov* 99(8):115-116, 1967.

4726 **GASTRIC BLEEDING DUE TO ACUTE EROSION AND ULCERATION OF THE STOMACH.** *(Rus.)* Grigor'ieva, L. V. (S. M. Kirov Inst. Postgrad. Med., Leningrad, USSR) and L. M. Kapitsa. *Vestn Khir Grekov* 99(8):111-115, 1967.

4727 **MEDICAL AND SOCIAL CONSIDERATIONS ON GASTRODUODENAL ULCERS.** *(It.)* Terzuolo, D. *Gazz Med Ital* 127(11):432-436, 1968.

4728 **THE DIAGNOSTIC VALUE OF INDIRECT RADIOLOGICAL SIGNS IN GASTRIC ULCER.** *(Heb.)* Itzchak, Y. D. (U. Tel-Aviv, Israel) and M. Pajewski. *Harefuah* 76(11):503-506, 1969.

4729 **ASSESSMENT OF THE THERAPEUTIC ACTION OF CR 242 OR XYLAMIDE IN GASTRIC AND DUODENAL ULCER AND IN GASTRODUODENAL DISEASES.** *(It.)* Bellomo, A. (Ospedale Maggiore di San Giovanni Battista, Turin, Italy), R. Strobbia and A. Manzoni. *Minerva Med* 60(23):1024-1041, 1969.

4730 **NINE CASES OF GASTRIC ULCER AFTER VAGOTOMY AND DRAINAGE FOR DUODENAL ULCER.** *(E.)* Bank, S. (Groote Schuur Hosp., Cape Town, S. Africa), I. N. Marks, J. H. Louw and B. Brom. *Gut* 10(6): 460-468, 1969.

4731 **IMMEDIATE RESECTION IN PATIENTS WITH PERFORATED GASTRIC-DUODENAL ULCER.** *(Ger.)* Ruëff, F. L. (Surg. Clin., U. Munich, Germany), H. Pelzl and R. Thurmayr. *Munchen Med Wschr* 111(35):1731-1737, 1969.

4732 APPLIED STOMACH PHYSIOLOGY IN ULCER SURGERY. *(Ger.)* Nyhus, L. M. (U. Illinois Coll. Med., Chicago). *Munchen Med Wschr* 111(31):1595-1597, 1969.

4733 GASTRIC ULCER REAPPRAISAL. *(E.)* Welch, C. E. (Harvard Med. Sch., Boston, Mass.) and J. F. Burke. *Surgery* 65(4):708-715, 1969.

4734 POSTBULBAR DUODENAL ULCER. *(It.)* Ferrero, P. G. (Inst. Radiol., U. Turin, Italy), E. Comino, G. L. Massa and M. Musso. *Arch Sci Med (Torino)* 124(4):443-495, 1967.

4735 PERFORATED PEPTIC ULCER IN AUCKLAND AND GLASGOW. *(E.)* Singh, B. N. (Auckland Hosp., New Zealand) and B. B. Taylor. *Aust New Zeal J Surg* 37(2):193-196, 1967.

4736 SOME ELECTROCARDIOGRAPHIC CHANGES IN ULCERS. *(It.)* Fiore, G. (Dolo Munic. Hosp., Venice, Italy) and A. Luzzatto. *Chir Ital* 18(3):422-437, 1966.

4737 PLASMA KININS IN DUODENAL ULCER. *(Rum.)* Baciu, I. (Inst. Med. Pharm., Cluj, Romania), Z. Baciu and L. Grosu. *Fiziol Norm Pat* 13(4):307-318, 1967.

4738 UNUSUALLY LARGE DUODENAL ULCERS. *(E.)* Calonje, M. A. (Ochsner Clin., New Orleans, La.) and S. F. Ochsner. *Southern Med J* 62(7):763-766, 1969.

4739 A TECHNIQUE OF PYLOROPLASTY. *(E.)* Cocks, J. R. (London, England) and A. M. Desmond. *Brit J Surg* 56(3):166-169, 1969.

4740 COMPLICATIONS OF INTRATHORACIC GASTRIC ULCER ASSOCIATED WITH HIATUS HERNIA. A DESCRIPTION OF FIVE CASES. *(E.)* MacArthur, A. M. (King's Coll. Hosp., London, England) and J. E. C. Wright. *Brit J Surg* 56(3):161-164, 1969.

4741 PERFORATED GASTRIC ULCER TOGETHER WITH ACUTE APPENDICITIS IN A 12-YEAR-OLD CHILD. *(Bul.)* Dimitrov, D. (Distr. Hosp., Sandanski, Bulgaria). *Khirurgiia (Sofiia)* 21(6):585-586, 1968.

See also: 4353,4354,4362,4376,4384,4543,4556,4646,4650

Regional Enteritis

4742 **REGIONAL ENTERITIS AND GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY.** *(E.)* Katsaros, D. and S. C. Truelove (Radcliffe Infirm., Oxford, England). *New Eng J Med* 281(6):295-296, 1969.

In a previous study, about 10% of patients with regional enteritis were found to be deficient in glucose-6-phosphate dehydrogenase (G-6-PD). In the present study, enzymatic assay was performed in 69, (41 female, 28 male) patients with regional enteritis and 49 patients with ulcerative colitis. No examples of G-6-PD deficiency were found.

4743 **MORBIDITY AND MORTALITY IN REGIONAL ENTERITIS. REPORT OF 168 CASES.** *(E.)* Banks, B. M. (Harvard Med. Sch., Boston, Mass.), L. Zetzel and H. S. Richter. *Amer J Dig Dis* 14(6):369-379, 1969.

The morbidity and mortality in 168 patients hospitalized and treated for regional enteritis during a 32 yr period have been reviewed. Every patient was traced and his status determined. The mean number of hospital admissions per patient was 3.8 during the period. The most frequent major complication was intestinal obstruction, which was present in 27% of the patients on their first admission, in 30% of those admitted for a second time, and in a similar proportion of patients requiring a third or fourth admission. Of all patients, 70% required major operations for treatment. Half of these had one or more additional major abdominal operations on a subsequent hospital admission. The number of such surgical procedures averaged 2.8 per patient. The surgical case mortality was 6.5%. Only 4 of 29 patients with the acute regional ileitis syndrome progressed to the chronic form. Less than 10% of the patients have died of regional enteritis.

4744 **SEVERE REGIONAL ENTERITIS WITH A UNIQUE DUODENOSIGMOID FISTULA FOLLOWING NORMAL PREGNANCY.** *(E.)* Holzbach, R. T. (Case-Western Reserve U. Sch. Med., Cleveland, Ohio) and J. C. Jones. *Amer J Gastroent* 52(1):48-55, 1969.

4745 **THE MANAGEMENT OF REGIONAL ENTERITIS.** *(E.)* Buxton, R. (Newport News, Va.) and S. Evans. *Virginia Med Monthly* 96(6):305-311, 1969.

4746 **CROHN'S ILEITIS AND PREGNANCY.** *(Fr.)* Duret, R. L. (Saint-Pierre U. Hosp., Brussels, Belgium) and L. Deloyers. *Acta Gastroent Belg* 32(4-5):365-376, 1969.

4747 **RARE LOCATIONS OF REGIONAL ENTERITIS.** *(Bul.)* Konstantinov, B. (Inst. Postgrad. Med., Sofia, Bulgaria). *Khirurgiia (Sofiia)* 21(6):548-552, 1968.

4748 **GLUCOSE INTOLERANCE AND INSULIN RESISTANCE IN PATIENTS WITH LIVER DISEASE.** *(E.)* Collins, J. R. (Vanderbilt U. Sch. Med., Nashville, Tenn.) and O. B. Crofford. *Arch Intern Med (Chicago)* 124(21):142-148, 1969.

The glucose intolerance observed in patients with liver disease was compared with that seen in patients with genetically determined diabetes mellitus. Serum glucose and insulin levels were measured during oral and i.v. glucose tolerance tests (GTT) in 16 patients with compensated liver disease, in 10 probable but not diagnostically confirmed diabetics and in 14 control subjects. Eleven of the 16 patients with liver disease had abnormal oral GTT results. The patients with liver disease and the diabetics had comparable degrees of glucose intolerance during both the oral and i.v. GTT, despite the presence of hyperinsulinemia in the former group. The mean "total insulin excess" was about twice as great in the patients with liver disease as in the diabetics. The mean rate constant, K, for the decrease in serum glucose concentration after termination of infusion was 1.12% and 1.07% per min, resp. Significant insulin resistance may be present in patients with liver disease.

4749 **SPECIFIC SMALL-INTESTINAL LACTASE DEFICIENCY IN ADULTS.** *(E.)* Gudmand-Höyer, E. (Rigshospitalet, U. Copenhagen, Denmark), A. Dahlqvist and S. Jarnum. *Scand J Gastroent* 4(4):377-386, 1969.

Specific small-intestinal lactase deficiency, in which the other disaccharidases have a normal activity and there are no morphological alterations of the mucosa, was found in 18 adult patients (10 female, 8 male) after performing lactose tolerance tests and/or small intestinal biopsies with disaccharidase activity assays in 700 out of 1300 adult patients at 2 gastroenterological units. Of the 18, only 4 had a history of a previous acute gastrointestinal disease. Clinical symptoms were present in 17, but only 8 had spontaneously noticed a relation between symptoms and milk intake. In many patients small amounts of milk were sufficient to provoke symptoms, and although dietary treatment was successful, exclusion of lactose was sometimes necessary. Age at onset of symptoms indicated that at least 9 and possibly 15 have the acquired form of lactase deficiency. Although the acquired specific lactase deficiency is probably not a congenital disease, a hereditary factor may nevertheless play a role in its genesis.

4750 **USE OF MEDIUM-CHAIN TRIGLYCERIDE DIETS IN CHILDREN WITH MALABSORPTION.** *(E.)* Leyland, F. C. (Inst. Child Hlth., U. London, England), A. S. Fosbrooke, J. K. Lloyd, M. M. Segall, I. Tamir, R. Tomkins and O. H. Wolff. *Arch Dis Child* 44(234):170-179, 1969.

Medium-chain triglyceride (MCT) diets, continued for 5 to 36 months, were used in the treatment of 13 children (8 male, 5 female; ages 1 month to 15½ yr) with malabsorption due to 4 types of disorders: obstructive jaundice (3), pancreatic insufficiency (3), α-β-lipoproteinemia (2), and intestinal lymphangiectasia (5). The diets produced a low intake of ordinary dietary fat (long-chain triglyceride) with MCT added as an oil for cooking or in a milk formula. Fecal fat was estimated using triple extraction with petroleum ether and gravimetric determination. MCT absorption was somewhat impaired where bile or pancreatic lipase was deficient, but was virtually complete in intestinal lymphangiectasia and α-β-lipoproteinemia where the intraluminar phase of fat digestion was normal. The control of steatorrhea in all 4 groups of disorders improved the general well-being of all the children. In those with lymphangiectasia serum albumin levels rose, generalized edema disappeared, and in 1 child marked acceleration of growth occurred. No significant effect on growth rate was observed in the others but in them factors other than malabsorption may have been responsible for growth retardation.

4751 **BILE-SALT DECONJUGATION AND STEATORRHOEA IN PATIENTS WITH THE STAGNANT-LOOP SYNDROME.** *(E.)* Tabaqchali, S. (Royal Postgrad. Med. Sch., London, England), J. Hatzioannou and C. C. Booth. *Lancet* 2(7558):12-16, 1968.

The concentrations of conjugated bile salts in the upper jejunal fluid of 6 fasting patients with steatorrhea due to the stagnant loop syndrome were reduced under 5 micromoles/liter (normal range: 5-10). The concentrations of the various bile salts were differentially reduced. The main bile salt remaining was glycocholate. In 4 patients quantitation of both conjugated and free bile acids was carried out at different levels of the small intestine from the duodenum to the ileum. Results showed that the presence of steatorrhea depends on the site and extent of bile-salt deconjugation throughout the small intestine and not merely on the presence of free bile acids. The major cause of steatorrhea may be the reduction rather than absence of the conjugated bile salts since steatorrhea was present when there was bile-salt deconjugation throughout the small intestine. It is suggested that the feeding of sodium taurocholate could relieve steatorrhea.

4752 **MEDIUM CHAIN TRIGLYCERIDES IN THE TREATMENT OF STEATORRHEA.** *(Ger.)* Kistler, H. J. (Med. U. Klin. Zurich, Switzerland). *Schweiz Med Wschr* 98(9):544-549, 1968.

Seven patients with well-developed steatorrhea were treated with medium chain triglycerides (MCT). The malabsorption was due to extensive small bowel resection in 1, chronic pancreatitis with severe pancreas insufficiency in 2, idiopathic sprue in 3, and to undetermined cause in 1. Steatorrhea markedly diminished during treatment. Two patients treated for 7-12 months showed: increased body weight, improvement in steatorrhea, and general well-being. The rationale for the use of MCT in the treatment of steatorrhea is that they are hydrolyzed and absorbed more rapidly than long chain triglycerides and are transported in unesterified form in the portal venous blood rather than in the intestinal lymph system.

4753 **ACTIVITY OF INTESTINAL DISACCHARIDASES IN CHILDREN WITH COELIAC SYNDROME.** *(Cz.)* Pelikán, L. (Med. Fac., Palacky U., Olomouc, Czechoslovakia) and Z. Matlocha. *Cesk Pediat* 24(4):305-311, 1969.

754 **BIOPSY OF THE DUODENUM IN SPRUE.** *(Fr.)* Cheli, R. *Arch Mal Appar Dig* 58(4-5): 45 & 248, 1969.

755 **ABSORPTION AND MALABSORPTION IN THE SMALL BOWEL.** *(Rev.)(E.)* Patterson, M. (U. Texas Med. Br., Galveston) and L. J. Gastiglioni. *Amer J Surg* 117(6):798-805, 1969.

4756 **LACTOSE MALABSORPTION: ITS PRACTICAL SIGNIFICANCE AND VERIFICATION.** *(Fin.)* Gorbatow, O. and J. Jussila. *Suom Lääk* 24(19):1677-1679, 1969.

See also: 4355,4566,4567,4843

4757 **CECAL DIVERTICULITIS: REPORT OF 16 CASES AND A REVIEW OF THE LITERATURE.** *(E.)* Asch, M. J. (Columbia U., Coll. Physicians & Surgeons, New York, N. Y.) and A. M. Markowitz. *Surgery* 65(6):906-910, 1969.

Sixteen patients (7 men, 9 women), average age 44.7 yr, with cecal diverticulitis were studied and compared with a series of 132 such cases assembled from the literature. In both series the signs and symptoms were those of appendicitis which was the most common preoperative diagnosis. There were 7 local excisions and 9 ileocolectomies in the first series, a ratio comparable to the procedures in the review group. Five of the 16 patients were found to have fecaliths in their diverticulum. Of 10 postoperative barium enemas, 6 were normal and 4 showed diverticuli elsewhere in the colon. Eight patients in the review series had preoperative barium enemas which demonstrated cecal pathology. Five of the review group were successfully treated conservatively after barium enema diagnoses of cecal diverticulitis. There was no mortality in the group of 16 and all were well at follow-up.

4758 **WOUND HEALING IN THE COLON: COMPARISON OF INVERTED AND EVERTED CLOSURES.** *(E.)* Trueblood, H. W. (Stanford Med. Sch., Palo Alto, Calif.), T. S. Nelson, S. Kohatsu and H. A. Oberhelman Jr. *Surgery* 65(6):919-930, 1969.

Two 2 cm longitudinal incisions were made in the proximal colon of 84 adult male Sprague-Dawley rats (400-450 g). Half of the rats had the proximal opening closed in an inverted fashion and the distal opening closed in an everted manner. This closure was reversed in the other animals. The animals were killed in groups of 12 on days 3, 6, 9, 12, 15, 18, and 28 postoperatively and bursting tensions at the sites of suture were compared. The model for measuring the strength of these healing intestinal wounds was so constructed that the suture line would be subjected to the maximal distracting force when inflated and the geometry controlled. The area closer to the ileocecal valve was significantly weaker than the more distal colon. The inverted closures were noted to have superior strength, less gross adhesion formation, and, on microscopic examination, a more prompt return to normal bowel architecture.

4759 **MULTIPLE MALIGNANT TUMOURS OF THE COLON AND RECTUM.** *(E.)* Dencker, H. (Lunds Lasarett, Sweden), G. Liedberg and S. Tibblin. *Acta Chir Scand* 135(3):260-262, 1969.

Multiple carcinomas of the colon and rectum were recorded as occurring simultaneously in 21 (2.3%) of 908 cases during an 8 yr study of malignant tumors of the colon and rectum. The mean age was 68 yr among the 13 women and 8 men. In only one third of cases was the multiplicity detected preoperatively. It is, therefore, important to search for further tumors at operations for carcinoma of the colon and rectum. Twenty-eight of the total 44 synchronous multiple tumors were in the rectum or the left half of the colon and 16 in the right half of the colon. There were metastases in 11 cases (regional lymph nodes in 9 and distant in 2). Twenty of the 21 came to surgery: hemicolectomy (7), abdominal perineal resection (6), local resection (4), colostomy (2), subtotal colostomy (1). All the tumors were adenocarcinomas: 13 were probably poly which had undergone malignant degeneration. Careful follow-up is necessary.

4760 **BACTERIA AND THE AETIOLOGY OF CANCER OF THE LARGE BOWEL.** *(E.)* Aries, V. (St. Mary's Hosp. Med. Sch., London, England), J. S. Crowther, B. S. Drasar, M. J. Hill and R. E. O. Williams. *Gut* 10(5):334-335, 1969.

The feces of 40 healthy English and 48 Ugandan adults were compared bacteriologically. The feces from English subjects contained significantly more bacteroides and bifidobacteria but fewer streptococci and lactobacilli than the Ugandans. The differences may be due to dietary differences: the English live on mixed animal and vegetable foods, the Ugandans live on a high carbohydrate vegetarian diet with little fat and almost no animal protein. Bacteroides are very active in the degradation of bile salts and they may produce carcinogens which may partially explain the higher incidence of large bowel cancer in the English.

4761 **THE ORIGIN OF FAECAL FAT.** *(E.)* Wiggins, H. S. (Central Middlesex Hosp., London, England), K. E. Howell, T. D. Kellock and J. Stalder. *Gut* 10(5):400-403, 1969.

Four healthy subjects with well established ileostomies were fed carmine marked test diets containing a high proportion of butter or corn oil and the proportions of the different fatty acids in the ileostomy dejects estimated. In contrast to feces in normal subjects with a colon, the composition of the ileostomy fat was greatly affected by changes in the dietary fat. Samples of nondietary fat in the ileostomy dejecta were show to differ significantly from dietary fat. Carmine marker transi time averaged 12.5 hr. The quality of fecal fat in the normal subject is largely determined by the addition of nondietary fat derived from intestinal desquamation and bacterial reduction of unsaturated fatty acids in the colon.

4762 **MOBILE CECUM SYNDROME.** *(Ger.)* Bay, V. (Surg. U. Clin., Hamburg, Germany), H. A. Bruns E. Farthmann and P. Matthaes. *Z Kinderchir* 5(Suppl.):91-98, 1968.

Of 700 patients with clinically and radiologically confirmed mobile cecum syndrome, cecopexy and appendectomy were performed in 135 and appendectomy only in 15. At the time of follow-up, 77 out of 122 patients (63%) were free of symp toms; 29 children (24%) had complaints due to conditions not related to cecopexy (e.g. peptic ulcer, parasitic diseases, inflammatory intestinal disease); 16 patients (13%) still had typical symptoms without radiological evidence of a mobile cecum. In a group of 12 of the patients who had had an appendectomy without cecopexy, 7 were free of complaints and 5 had continuing typical pain. Cecopexy and appendectomy in cases of the mobile cecum syndrome are recommended spec ally in those under 12.

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4763 **MUCOCELE AND CARCINOMA OF THE APPENDIX.** *(It.)* Molinari, L. (Civ. Hosp. Borgonovo, Italy) and L. Bolognesi. *Chir Gastroent* 2(2): 215-221, 1968.

A case of carcinoma of the appendix (male, 75 yr old, previously operated on for hypertrophy of the prostate, and gasrectomy for gastric ulcer) and a case of malignant mucocele female, 50 yr old, previously operated on for ovarial cyst). In oth patients the symptoms were: pain in the right fossa iliaca Lanz and McBurney's points), nausea, vomiting, fever; poor eneral condition, with pallor of the skin and mucous memranes and a positive Rowsing and Blumberg's test. In the first atient, when the abdominal cavity was opened, an edematous, eddish, 7 cm long appendix, firmly adherent to the cecum, vas observed. Adhesiotomy, and appendectomy were performed. he patient recovered completely. Histological examination howed an adenocarcinoma of the appendix. In the second atient, a dense layer of mucous and gelatinous substance in he right fossa iliaca and an edematous and thickened appendix, overed with the same substance, were found. Appendectomy nd plastic reconstruction of the wall, by previous tubular rainage of the peritoneal cavity, were performed. Histological xamination showed malignant appendicular mucocele due to elatinous carcinoma of the appendix. The patient died 5 nonths later of neoplastic cachexia.

764 **SURVIVAL TIME IN RECTUM CANCER.** *(Fr.)* Levrat, M., J. P. Leonard and F. Brodschii. *Rev yon Med* 17(11):483-489, 1968.

or a period of 20 yr, 200 rectal cancer patients have been udied and statistically evaluated. They were divided in 3 ain groups: 47 patients were not operated; 33 patients reeived a simple colostomy; 115 patients were treated with urative operations, conservative surgery, or amputation. The perative mortality for these types of operations were resp. 2%, 16% and 13%. The survival in the first 2 groups (not perated and simple colostomy) was low: 80% of the patients ed 1 yr after the operation or the diagnosis; 2 patients surved more than 5 yr. Among the group receiving curative perations, 55 patients survived more than 5 yr. Young age, cerative forms, or late diagnosis make for an unfavorable progsis. Survival was higher for women and for patients who had prolonged tumor evolution before diagnosis; tumors located gh in the rectum, those which do not penetrate beyond the ctal wall, and degenerative benign tumors have a better progsis.

'65 **RESULTS OF LOW ILEO-SIGMOIDAL OR ILEO-RECTAL ANASTOMOSIS AFTER TOTAL R SUBTOTAL COLECTOMY.** *(Fr.)* Mialaret, J. *Bull Acad t Med (Paris)* 152(11-12):173-181, 1968.

o-rectal anastomosis following subtotal or total colectomy s performed in 50 cases (40 hemorrhagic colitis and 10 lyposis). There were 5 deaths (12.5%) attributed mainly to e seriousness of the patient's condition and 2 deaths were due the partial separation of the anastomosis. Anastomotic erations were simpler after colectomy than after ileostomy; rmal transit usually returned after 3 days. Recovery of an astomized rectum depends upon its condition at the time operation, upon its response to local treatment and upon e length of the recto-sigmoidal tract.

4766 **SUPPLEMENTARY SURVEY OF APPENDICITIS IN AFRICANS (ONE THOUSAND CASES).** *(Fr.)* Carayon, A. (Gen. Hosp., Dakar, Senegal) and F. Blin. *Bull Soc Med Afr Noire Lang Franc* 13(3):696-698, 1968.

The frequency of appendicitis in Africans has been determined during 1949-67. During the yr 1961-68, 465 appendicitis cases were observed (3.6% of all the patients hospitalized at the General Hopital, Dakar); 68% were acute appendicitis, 11% chronic, and 20% peritoneal complications. During the yr 1952-60 there were less acute forms (50%), more chronic forms (28%) and about the same percentage of complications (22%), with the same incidence of appendicitis in the total population. More chronic (36%) and less acute appendicitis cases (30%) were observed during the yr 1949-1952.

4767 **PAINLESS HEMORRHOIDECTOMY.** *(Fl.)* Ceulemans, G. *T Gastroent* 11(6):593-598, 1968.

4768 **RECTAL AND ANAL PROLAPSE.** *(Dut.)* Wittebol, P. (U. Med. Clin. Cent. Hosp., Amsterdam, Netherlands). *T Gastroent* 11(6):561-573, 1968.

4769 **FAMILIAL POLYPOSIS OF THE LARGE INTESTINE IN AN 11-YEAR-OLD BOY.** *(Pol.)* Sztaba, R. (Pediat. Surg. Clin., Gdańsk, Poland). *Wiad Lek* 21(22):2051-2053, 1968.

4770 **A CASE OF DOUBLE CANCER OF THE COLON.** *(Pol.)* Kulicz, A. *Wiad Lek* 21(22): 1985-1986, 1968.

4771 **LYMPHANGIOMATOUS HAMARTOMA WITH INTUSSUSCEPTION OF THE CAPUT CAECI.** *(E.)* Nagle, R. (Dept. Pathol., U. Edinburgh, Scotland). *Brit J Surg* 55(11):879-880, 1968.

4772 **PERFORATION OF THE CECUM DURING THE COURSE OF SYSTEMIC LUPUS ERYTHEMATOSUS.** *(Pol.)* Litwin, M. (1st Surg. Clin., Acad. Med., Lublin, Poland), L. Kurylcio and S. Kurylcio. *Pol Przegl Chir* 40(11):1388-1390, 1968.

4773 **SUCCESSFUL SURGICAL TREATMENT OF RECURRENT CANCER OF THE LARGE INTESTINE.** *(Rus.)* Miagkii, M. A. *Vop Onkol* 14(12):100-101, 1968.

4774 **SURGICAL TREATMENT OF ACUTE ANORECTAL THROMBOPHLEBITIS.** *(Rus.)* Briakin, M. I. (Alma-Ata Med. Inst., USSR) and N. V. Mun. *Khirurgiia (Moskva)* 44(12):94-97, 1968.

4775 **AGENESIS OF THE VERMIFORM APPENDIX: REPORT OF A CASE.** *(Por.)* Lomba Galvão, M. S. (Fac. Med., Fed. U. Espirito Santo, Brazil). *Folha Med* 56(2):203-205, 1968.

4776 **ABDOMINAL PAIN IN 123 PATIENTS WITH UNCOMPLICATED DIVERTICULOSIS OF THE COLON.** *(Por.)* Siffert, G. Jr. (Sch. Postgrad. Med., Pontificia Cath. U., Rio de Janeiro, Brazil), M. F. Gomes Jardim, R. Bretas Bhering and M. J. de Brito Viegas. *Folha Med* 56(2): 233-238, 1968.

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4777 **PROCTITIS RESULTING FROM RADIOTHERAPY.** *(Por.)* Pinheiro Magalhães, J. (Gen. Polyclin., Rio de Janeiro, Brazil) and E. Meireles de Miranda. *Folha Med* 56(2):279-286, 1968.

4778 **HIRSCHSPRUNG'S DISEASE IN THE ADULT.** *(E.)* Lockhart-Mummery, H. E. (St. Mark's Hosp., London, England). *Acta Chir Belg* (Suppl. 2):39-46, 1967.

4779 **EXPERIENCES WITH ANAL FISTULAE.** *(Dut.)* Gruwez, J. A. (St. Rafael U. Med. Clin., Louvain, Belgium), E. van Calster and A. Lacquet. *Acta Chir Belg* (Suppl. 2):27-38, 1967.

4780 **POLYPOSIS OF THE COLON.** *(Dut.)* van der Voort, G. (Stuivenberg Hosp., Antwerp, Belgium). *Acta Chir Belg* (Suppl. 2):93-98, 1967.

4781 **VASCULAR DISORDERS OF THE COLON.** *(E.)* Marston, A. (Middlesex Hosp., London, England). *Acta Chir Belg* (Suppl. 2):80-91, 1967.

4782 **REVERSIBLE VASCULAR REGIONAL COLITIS.** *(Fl.)* Hubens, A. (Stuivenberg Hosp., Antwerp, Belgium), C. Dochez and W. Van Vooren. *T Gastroent* 11(6): 551-560, 1968.

4783 **PREOPERATIVE TREATMENT OF PATIENTS ADMITTED FOR SURGERY ON THE COLON: WATER AND ELECTROLYTE BALANCE, CHANGES THEREIN, THE CLINICAL PICTURE, AND PATHOGENESIS.** *(Sp.)* Requesens Manterola, C. (Pages Milit. Hosp., Melilla, Spain). *Med Cir Guerra* 29(10):561-567, 1967.

4784 **MEASLES AND ACUTE APPENDICITIS IN CHILDREN.** *(Rus.)* Fel'dman, Kh. I. (Kiev Med. Inst., USSR), G. S. Drach and R. I. Zabara. *Pediatriia* 46(8):77-78, 1967.

4785 **TORSION OF THE SIGMOID.** *(Pol.)* Nagay, B. (2nd Surg. Clin., Polish Med. Acad., Szczecin). *Pol Przegl Chir* 39(9):865-869, 1967.

4786 **A CRITIQUE OF ANAL GLANDULAR INFECTION IN THE AETIOLOGY AND TREATMENT OF IDIOPATHIC ANORECTAL ABSCESSES AND FISTULAS.** *(E.)* Goligher, M. E. (Gen. Infirm., Leeds, England) and A. G. Pissidis. *Brit J Surg* 54(12):977-983, 1967.

4787 **SPHINCTER SAVING EXCISION IN SEVERE PROCTOSIGMOID IRRADIATION INJURIES.** *(E.)* Scheinin, T. M. (Deaconess Hosp., Helsinki, Finland) and O. Kivioja. *Acta Chir Scand* 133(7):584-590, 1967.

4788 **THERAPY OF HEMORRHOIDS WITH PARK'S OPERATION.** *(Dut.)* Seghers, K. (Imelda Hosp., Bonheiden, Belgium) and G. Verbeeck. *Acta Chir Belg* (Suppl. 2):10-20, 1967.

4789 **SEXUAL DYSFUNCTION AFTER RECTAL SURGERY.** *(Dut.)* Ceulemans, G. *Acta Chir Belg* (Suppl. 2):21-26, 1967.

4790 **HIRSCHSPRUNG'S DISEASE ASSOCIATED WITH A VARIANT FORM OF ACHONDROPLASIA, IN SISTER AND BROTHER.** *(E.)* Roberts, P. A. L. (Royal Alexandra Hosp. Sick Child., Brighton, England), T. P. Mann and J. Rubin. *Proc Roy Soc Med* 62(4):329, 1969.

4791 **CANCER OF THE COLON AND OF THE RECTUM IN ISRAEL.** *(Heb.)* Mass, N. (Beth Cholim, Tel Hashomer, Israel) and B. Modan. *Harefuah* 86(10):464-468, 1969.

4792 **BLOOD AND IRON LOSS IN COLITIS.** *(E.)* Stack, B. H. R. (St. Mark's Hosp., London, England), T. Smith J. H. Jones, and J. Fletcher. *Proc Roy Soc Med* 62(5):497, 1969.

4793 **ERRORS AND DANGERS IN THE DIAGNOSIS OF ACUTE APPENDICITIS.** *(Ger.)* Schmauss, A. K. (Städtischen Krankenhauses im Friedrichshain, Berlin, Germany). *Z Aerztl Fortbild (Jena)* 63(9):486-491, 1969.

4794 **ABDOMINAL TRAUMA.** *(Por.)* Diniz Filho, O. (Santa Casa de Misericórdia, Belo Horizonte, Brazil) and A. M. Ribeiro. *Rev Ass Med Minas Gerais* 19(2): 127-134, 1969.

4795 **THE USE OF PLASMA CORTISOL ESTIMATIONS IN THE MANAGEMENT OF COLITIS.** *(E.)* Jones, J. H. (St. Mark's Hosp., London, England), M. Friedman, J. M. Hinton and J. E. Lennard-Jones. *Proc Roy Soc Med* 62(5):497-499, 1969.

4796 **X-RAY DIAGNOSIS OF INTESTINAL INVAGINATION IN CHILDREN.** *(Ger.)* Manolov, L. (Child. Surg. Clin., Sofia, Bulgaria), I. Ivantschev and C. Christov. *Radiol Diagn* 10(1):9-14, 1969.

4797 **CARCINOMA OF THE LARGE INTESTINE AFTER RADIUM THERAPY OF THE FEMALE GENITAL ORGANS.** *(Ger.)* Yasargil, E. O. (U. Surg. Clin., Basel, Switzerland) and K. G. Bregulla. *Helv Chir Acta* 34(5): 399-405, 1967.

4798 **ANCHORING MECHANISMS OF THE ANORECTAL REGION. PART II.** *(E.)* Wilson, P. M. (Dept. Anat., U. Cape Town, S. Africa). *S Afr Med J* 41(44):1138-1143, 1967.

4799 **CLINICAL AND PATHOLOGICAL ASPECTS OF CANCER OF THE COLON IN 193 SURGIC CASES: RESULTS OF SURGICAL TREATMENT.** *(Jap.)* Majima, S., K. Karube, T. Narisawa, T. Takahashi and T. Machida. *Jap J Cancer Clin* 13(11):998-1004, 1967.

4800 **CLINICAL AND PATHOLOGICAL ASPECT OF CANCER OF THE COLON IN 193 SURGIC CASES: SYMPTOMS AND PATHOLOGICAL FINDINGS.** *(Jap.)* Majima, S., K. Karube, T. Narisawa, I. Yamaguchi, K. Yoshida and T. Teshima. *Jap J Cancer Clin* 13(10):861-868, 1967.

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4801 **CLINICAL AND PATHOLOGICAL ASPECTS OF RECTAL CANCER IN 326 SURGICAL CASES: SYMPTOMS AND PATHOLOGICAL FINDINGS.** *(Jap.)* Majima, S., K. Karube, T. Narisawa, H. Hoshi and T. Hiroki. *Jap J Cancer Clin* 13(12):1088-1093, 1967.

4802 **TREATMENT OF A PERINEAL WOUND AFTER COMBINED EXTIRPATION OF THE RECTUM.** *(Rus.)* Ryzhikh, A. N. (Sci. Res. Lab. Proctol. Clin. Minist. Hlth. RSFSR, USSR), V. B. Aleksandrov and I. M. Inoiatov. *Vestn Khir Grekov* 99(11):85-88, 1967.

4803 **CANCER OF THE RECTUM.** *(Rev.)(Fr.)* Keuchkérian, A. *Rev Med Toulouse* 5(6):713-728, 1969.

4804 **COLONIC DIVERTICULOSIS AND DIVERTICULITIS.** *(Fin.)* Salmenkivi, K. *Suom Lääk* 24(19):1680-1682, 1969.

4805 **EFFECTIVE DECOMPRESSION OF THE COLON BY TRANSVERSE COLON TUBE COLOSTOMY.** *(E.)* Drosd, R. E. (U. Miami Sch. Med., Fla.) and E. Shocket. *Surg Gynec Obstet* 129(1):123-125, 1969.

4806 **SOME PROBLEMS OF HIRSCHSPRUNG'S DISEASE.** *(Rev.)(E.)* Aziz Abdel, A. (Fac. Med., U. Assiut, Egypt). *Alexandria Med J* 15(1):61-72, 1969.

4807 **NEONATAL ACUTE APPENDICITIS. [CASE REPORT]** *(E.)* Parkhurst, G. F. (Ellis Hosp., Schenectady, N. Y.) and S. C. Wagoner. *New York J Med* 69(13):1929-1930, 1969.

4808 **ACUTE LEFT-SIDED APPENDICITIS. [CASE REPORT]** *(E.)* Owen-Smith, M. S. (Milit. Hosp., Terendak, Malacca, Malaysia). *Brit J Surg* 56(3):233-234, 1969.

4809 **CROHN'S DISEASE OF THE APPENDIX PRESENTING AS ACUTE APPENDICITIS. [CASE REPORT]** *(E.)* Hall, J. H. (Watford Gen. Hosp., England) and M. D. Hellier. *Brit J Surg* 56(5):390-392, 1969.

4810 **DIVERTICULUM OF CAECUM.** *(E.)* Peeling, W. B. (Royal Gwent Hosp., Newport, England) and D. A. Aubrey. *Brit J Surg* 56(2):145-148, 1969.

4811 **PERFORATION IN DUPLICATION OF COLON. [CASE REPORT]** *(E.)* Reid, I. S. (Papuan Med. Coll., Boroka, Papua, New Guinea). *Brit J Surg* 56(2):155-156, 1969.

4812 **CARCINOMA OF LARGE BOWEL ASSOCIATED WITH ACUTE APPENDICITIS.** *(E.)* Miln, D. C. (Stobhill Gen. Hosp., Glasgow, Scotland) and I. S. McLaughlin. *Brit J Surg* 56(2):143-144, 1969.

4813 **DUPLICATION OF THE COLON. [CASE REPORT]** *(E.)* McPherson, A. G. (Southmead Hosp., Bristol, England), J. E. Trapnell and G. R. Airth. *Brit J Surg* 56(2):138-142, 1969.

4814 **THE INCIDENCE OF LYMPHOID FOCI IN THE LARGE INTESTINE.** *(E.)* Traill, M. A. (Repatriation Gen. Hosp., Heidelberg, Victoria, Australia). *Med J Aust* 2(16):809-810, 1967.

4815 **PERFORATION OF THE COLON.** *(Bul.)* Zlatarski, G. *Khirurgiia (Sofiia)* 21(6):532-537, 1968.

4816 **PERSONAL EXPERIENCE IN TREATING RECTAL PROLAPSE.** *(Bul.)* Mikhailov, P. (Inst. Milit. Med., Sofia, Bulgaria). *Khirurgiia (Sofiia)* 21(6):537-542, 1968.

See also: 4290,4530,4541,4547,4568,4701,4706,4708,4741,4817,5020,5065,5080

Ulcerative Colitis

4817 **GRANULOMATOUS COLITIS.** *(E.)* Barnett, W. O. (U. Mississippi Med. Ctr., Jackson), L. O. Mora and J. E. Varner. *Southern Med J* 62(4):373-377, 1969.

Twenty cases (12 male, 8 female) of granulomatous colitis managed during an 8 yr period are reviewed. Eighty percent of these patients were less than 40 yr of age. The more prominent clinical findings consisted of diarrhea, abdominal pain, fever, and weight loss. The total colon and rectum were involved in 5 cases, and a less extensive disease process in the rest. Complications such as perirectal abscess (5), and fistulae (5 rectal and 5 enterocutaneous) were observed. Stenosis (3) and obstruction (2) of the bowel lumen were also prominent as complications. A segmental resection with preservation of some of the normal appearing colon was utilized in cases of limited involvement (9). Total colectomy and ileostomy were used where there was extensive disease (4). Segmental resection was followed by a relatively high rate of recurrence (30-40%), while total colectomy can be expected to yield good results on a long term basis. Ileoproctoscopy appeared to be an unsatisfactory surgical procedure because of an exceedingly high recurrence rate at the suture line. There were no operative deaths among the 13 cases managed surgically. Pseudodiverticuli, a cobblestone appearance of the mucosa, and internal fistula formation in the large intestine are suggestive of granulomatous colitis.

4818 **THE NATURE OF BENIGN STRICTURES IN ULCERATIVE COLITIS.** *(E.)* Goulston, S. J. M. (Royal Prince Alfred Hosp., Sydney, Australia) and V. J. McGovern. *New Eng J Med* 281(6):290-295, 1969.

A series of 19 benign strictures of the colon in chronic ulcerative colitis patients showed insufficient fibrosis in the resected specimens to account for the narrowing. Measurements of the various layers of the gut wall were made in both the portions involved and those not involved by stricture, and these were compared with similar measurements in resected specimens from patients with ulcerative colitis without stricture and in normal sigmoid colons. The most striking finding was that in ulcerative colitis the muscularis mucosae is hypertrophied and is in a state of contraction. In the zones of stricture the contraction appears to be so forceful that the inner circular coat of the muscularis mucosae pulls away from the outer longitudinal coat, thereby narrowing the lumen of the gut. Such strictures should therefore be reversible.

4819 **THE ROLE OF ELECTROCOAGULATION OF THE THALAMO-CORTICAL FIBERS IN THE TREATMENT OF HEMORRHAGIC RECTOCOLITIS.** *(Fr.)* Hillemand, P. *Actualites Hepatogastroent Hotel Dieu* 4(5): A276-A283, 1968.

4820 **MEDICAL TREATMENT OF HEMORRHAGIC RECTOCOLITIS.** *(Fr.)* Bernier, J. J. *Actualites Hepatogastroent Hotel Dieu* 4(5):A257-A261, 1968.

4821 **GLYCOGENOSIS AND ULCERATIVE COLITIS IN A THREE-YEAR-OLD CHILD.** *(Cz.)* Kesslerová, Z. (Fac. Gen. Med., Charles U., Prague, Czechoslovakia), M. Kobylková and A. Valík. *Cesk Pediat* 23(10):917-921, 1968.

4822 **RECENT ADVANCES IN MEDICAL TREATMENT OF ULCERATIVE COLITIS.** *(E.)* Truelove, S. C. (Radcliffe Infirm., Oxford, England). *Proc Roy Soc Med* 62(5):502, 1969.

4823 ***ESCHERICHIA COLI*** **AND ULCERATIVE COLITIS.** *(E.)* Cooke, E. M. (St. Bartholomew's Hosp., London, England). *Proc Roy Soc Med* 62(5):501-502, 1969.

4824 **IMMUNOSUPPRESSIVE THERAPY IN ULCERATIVE COLITIS.** *(E.)* Jones R. A. (West Suffolk Gen. Hosp., Bury St. Edmunds, England). *Proc Roy Soc Med* 62(5):499-501, 1969.

4825 **PATHOGENESIS OF ULCERATIVE COLITIS.** *(Fr.)* Crabbé, P. (Med. Clin., Louvain, Belgium). *Louvain Med* 86(9):539-551, 1967.

4826 **COURSE AND PROGNOSIS OF ULCERATIVE COLITIS DEVELOPING IN CHILDHOOD.** *(E.)* Hughes, E. S. R. (Royal Melbourne Hosp., Australia). *Med J Aust* 1(9):443-444, 1969.

4827 **ULCERATIVE COLITIS: THINGS TO KNOW BEFORE GIVING STEROIDS.** *(E.)* Gelzayd, E. A. (Wayne State U. Sch. Med., Detroit, Mich.). *Consultant* 9(5):14-17, 1969.

4828 **ULCERATIVE COLITIS AND GRANULOMATOUS DISEASE OF THE BOWEL. SOME OF THEIR FAMILIAL AND GENETIC CHARACTERISTICS WITH A REPORT OF ULCERATIVE COLITIS IN THREE OF FIVE SIBLINGS.** *(E.)* Van Der Reis, L. (U. California Sch. Med., San Francisco). *Amer J Gastroent* 52(1):56-64, 1969.

See also: 4708

PANCREAS

4829 THE SURGICAL TREATMENT OF PANCREATIC PSEUDOCYSTS. *(E.)* Dencker, H. (Lunds Lasarett, U. Lund, Sweden), G. Liedberg and S. Tibblin. *Acta Chir Scand* 135(3):218-220, 1969.

Twenty eight patients (18 male, 10 female) with pancreatic cysts, all nonneoplastic, were operated upon during an 18 yr period. Of the 32 operations performed, external drainage was used 22 times (marsupialization, 15 and simple drainage, 7). Twenty-seven of the cysts were grossly classified as pseudocysts, 1 was described as a retention cyst. In 5 the etiology was trauma, 23 were postinflammatory. Three of the 4 procedures requiring reoperation were external drainage types. One death occurred postoperatively due to multiple pulmonary emboli. The median fistulation time was 3 months in externally drained cysts. Drainage procedures required a somewhat longer postoperative hospitalization.

4830 CYSTIC FIBROSIS OF THE PANCREAS. A GENERALISED DISTURBANCE OF WATER AND ELECTROLYTE MOVEMENT IN EXOCRINE TISSUE. *(E.)* Johansen, P. G. (Royal Children's Hosp., Melbourne, Australia), C. M. Anderson and B. Hadorn. *Lancet* 1(7540): 455-460, 1968.

Investigations have been made of 10 patients with proven mucoviscidosis who had sufficient functioning pancreatic tissue to prevent signs and symptoms of malabsorption. In response to the standard test for pancreatic function by the i.v. injection of pancreozymin-secretin, they produced a scanty viscous pancreatic secretion with an extremely low bicarbonate ion content in contrast to the copious watery fluid with a high bicarbonate ion content obtained from healthy persons. The total output of pancreatic enzymes was usually within the normal range. In essence, the response to pancreozymin in the patients with mucoviscidosis was normal while the response to secretin was grossly decreased. In a few patients a high secretin dose increased the volume and bicarbonate-ion content of the pancreatic secretion, indicating that there might be a "threshold effect"; however, normal levels were not attained. An hypothesis based on these observations and current knowledge relates the disturbance in mucous and serous glands in mucoviscirdosis to a single biochemical abnormality: the inhibition of the movement of water and ions through the secretory cells in the affected glands. This disturbance probably is in the extracellular space, and is related to the structure or porosity of mucopolysaccharide-rich regions, either in the connective tissue itself or in a mucoid-rich layer next to the cell plasmamembrane.

4831 PANCREOZYMIN-SECRETIN TEST OF EXOCRINE PANCREATIC FUNCTION IN CYSTIC FIBROSIS AND THE SIGNIFICANCE OF THE RESULT FOR THE PATHOGENESIS OF THE DISEASE. *(E.)* Hadorn, B. (Royal Child. Hosp., Pres. Found., Melbourne, Australia), P. G. Johansen and C. M. Anderson. *Aust Paediat J* 4(1):8-22, 1968.

Pancreozymin-secretin tests were performed on 10 children with cystic fibrosis of the pancreas who showed no clinical symptoms of exocrine pancreatic insufficiency. After an overnight fast, duodenal intubation was carried out using a special three-lumened pediatric duodenal tube. Pancreatic secretion was stimulated by i.v. injection of 2 U/kg pancreozymin and, after 20 min, 2 U/kg secretin. Five samples of duodenal juice were obtained from each patient at 10-min intervals and determinations made. The mean and range of values were compared with those from a control group of 27 children. All parameters of exocrine pancreatic function, volume, bicarbonate, and enzymes were dimished in the patients. Volume was about 3 times lower and bicarbonate output about 10 times lower than the lowest value in the control group. Enzyme output, which was not so severly reduced, showed great variation, and the values for patients and for controls overlapped. When the mean enzyme output of patients was compared with the lowest control value, the values for patients were in the normal range, with the exception of amylase. The total output of bicarbonate and the total output of chymotrypsin were plotted on a graph, the former on the ordinate and the latter on the abscissa. The values for patients and those for controls formed 2 distinct populations with no overlap of values. In patients there is a discrepancy between enzyme output and bicarbonate output. At least in this specific group of patients water and bicarbonate secretion from the pancreas was more severely affected than enzyme secretion. The pathological features of the pancreas in cystic fibrosis may result from the failure to produce an adequate amount of electrolyte containing fluid, and changes in other organs may result from a similar phenomenon.

4832 FATTY ACID COMPOSITION OF THE FECAL LIPIDS IN CHILDREN WITH CYSTIC FIBROSIS BEFORE AND DURING TREATMENT WITH PANCREATIN. *(It.)* Cardi, E. (Pediat. Clin., U. Rome, Italy), M. Antonelli and L. Annibaldi. *Minerva Pediat* 19(27):2011-2013, 1967.

4833 SURGICAL TREATMENT OF PANCREATIC CYSTS, BASED ON 7 PERSONAL CASES. *(Gr.)* Psomopoulos, N. (1st Surg. Clin., U. Athens, Greece). *Galenus* 19(9):561-576, 1967.

4834 THE SYNDROME OF CONGENITAL PANCREATIC INSUFFICIENCY, CHRONIC RESPIRATORY DISEASE AND CHRONIC LIVER DAMAGE. *(E.)* Havlíková, D. (3rd Pediat. Clin., Charels U., Prague, Czechoslovakia), O. Vychytil and J. Jelínek. *Acta Paediat Scand* 56(6):676-680, 1967.

4835 FAMILIAL PANCREATIC EXOCRINE DYSFUNCTION WITH PANCREATIC CALCIFICATION. *(E.)* Mann, T. P. (Royal Alexandra Hosp. Sick Child., Brighton, England) and J. Rubin. *Proc Roy Soc Med* 62(4):326, 1969.

4836 ENTRY OF COMMON BILE AND PANCREATIC DUCTS INTO A DUODENAL DIVERTICULUM. CAUSE OF PANCREATICOBILIARY DISEASE. *(E.)* Willox, G. L. (U. Alberta Hosp., Edmonton, Canada) and L. B. Costopoulos. *Arch Surg (Chicago)* 98(4):447-450, 1969.

PANCREAS

4837 **SUBACUTE PANCREATITIS AND CONGENITAL MALFORMATION OF THE BILE DUCT IN CHILDREN.** *(Fr.)* Roy, C. (Trousseau Hosp., Paris, France), J. Navarro, D. Graveleau, G. Lasfargues and A. Toudoire. *Ann Med Intern (Paris)* 120(3):163-171, 1969.

4838 **MUCOVISCIDOSIS.** *(Ger.)* Stephan, U. (Pediat. Clin., U. Erlangen, Germany). *Landarzt* 44(34): 1662-1668, 1968.

4839 **THE PATHOGENESIS AND TREATMENT OF FUNCTIONAL DISEASES OF THE PANCREAS.** *(Ger.)* Kalhammer, E. (Distr. Hosp., Memmingen, Germany). *Landarzt* 44(34):1681-1685, 1968.

4840 **SOME SPECIFIC CHARACTERISTICS OF PANCREATIC TUMOR CELLS.** *(Rus.)* Kudinskii, Iu. G. (N. I. Pirogov State Med. Inst., Odessa, USSR). *Vop Onkol* 14(12):18-22, 1968.

4841 **IMMATURITY AND MALFORMATIONS IN CASES OF CYSTIC FIBROSIS OF THE PANCREAS.** *(Cz.)* Havlíková, D. (Fac. Gen. Med., Charles U., Prague, Czechoslovakia). *Cesk Pediat* 23(10):886-889, 1968.

4842 **A STUDY OF PANCREATIC EXOCRINE FUNCTION IN PATIENTS WITH BILLROTH II GASTRECTOMIES: I. THE EFFECTS OF STIMULATION WITH MEAT BROTH ON AN EMPTY STOMACH.** *(It.)* Condorelli, S. (Inst. Gen. Clin. Med., U. Rome, Italy), R. Gusmano, L. Pisano, G. Lorentz, G. Spanò, G. Bellisario and F. Patanè. *Boll Soc Ital Biol Sper* 44(5):373-375, 1968.

4843 **FATTY ACIDS IN THE BLOOD SERUM OF GASTRECTOMY PATIENTS WITH EXOCRINE PANCREATIC INSUFFICIENCY.** *(It.)* Lombardi, D. (Inst. Clin. Med., U. Rome, Italy), S. Condorelli, G. Spano, R. Gusmano, L. Pisano and G. Lorentz. *Boll Soc Ital Biol Sper* 44(5):384-386, 1968.

4844 **LOCALIZED BRUIT IN CARCINOMA OF THE PANCREAS. [CASE REPORT]** *(E.)* Hardcastle, J. D. (London Hosp., England), J. L. Grogono and M. J. Sworn. *Brit J Surg* 56(1):79, 1969.

4845 **PSEUDOCYST OF THE PANCREAS IN A CHILD.** *(E.)* Attard, J. (Luton and Dunstable Hosp., Luton, England). *Brit J Surg* 56(3):235-238, 1969.

4846 **TRAUMATIC RUPTURE OF THE PANCREAS WITH COMPLICATIONS. [CASE REPORT]** *(E.)* Thomson, R. G. (Dept. Surg., U. Liverpool, England) and J. B. McFarland. *Brit J Surg* 56(2):117-120, 1969.

4847 **PSEUDOCYSTS OF THE PANCREAS IN CHILDREN.** *(Ger.)* Kern, J. (1st Surg. Clin., Med. Inst., Augsburg, Germany), F. Haggenmüller and H. Gumrich. *Med Welt* 20(29):1619-1622, 1969.

4848 **A TECHNIQUE OF PANCREATICODUODENECTOMY.** *(E.)* Phelan, J. T. (Roswelb Park Mem. Inst., Buffalo, N. Y.) and S. H. Nadler. *Surg Gynec Obstet* 129(1):116-122, 1969.

4849 **ULCEROGENIC TUMOR OF THE PANCREAS. ZOLLINGER-ELLISON SYNDROME.** *(Sp.)* Fongi, E. G. (8th Chair of Med., U. Buenos Aires, Argentina), R. Lagioia, L. Munist and S. Rascovsky. *Prensa Med Argent* 56(9):375-382, 1969.

4850 **CANCER OF THE PANCREAS.** *(Fr.)* Imbert, J.-C. (Hopital Cochin, Paris, France). *Rev Med* 10(16):989-992, 1969.

See also: 4269,4298,4301,4587,4592,4880,4916,4944,5000

Pancreatitis

4851 BETA-CAROTENE, VITAMIN A AND VITAMIN E SERUM LEVELS IN PATIENTS WITH CHRONIC PANCREATITIS. *(Cz.)* Bartos, V. (Fac. Med. Charles U., Hradec Králové, Czechoslovakia) and J. Groh. *Cesk Gastroent Vyz* 22(3):149, 1968.

Concentration determinations were made of beta-carotene, vitamins A and E in the serum of 24 patients with chronic pancreatitis. Blood levels of these substances were related to the secretory capacity of the pancreas as evaluated by the pancreozymin test. The average concentrations of both vitamins and beta-carotene were significantly lower in patients with severe pancreas disorders than with slight disorders: 80.9 μg/100 ml beta-carotene in severe pancreatitis versus 113.2 μg/100 ml in mild pancreatitis; 69.0 μg/100 ml vitamin A in severe versus 112.1 μg/100 ml in mild pancreatitis and 11.3 μg/100 ml vitamin E in severe and 13.6 μg/100 ml in mild pancreatitis. Levels of vitamin A were deficient in 4 patients and of vitamin E in 2. The secretion of pancreatic enzymes showed a statistically significant correlation between serum vitamin A and E levels and lipase. Even in the absence of steatorrhea, vitamin A and E deficiencies may be found in patients with chronic pancreatitis.

4852 SOME ASPECTS OF THE DIAGNOSIS ARE TREATMENT OF THE POSTOPERATIVE PANCREATITIS. *(Rus.)* Sokolov, V. I. (Sci. Res. Inst. Clin. Exp. Surg., Moscow) and R. L. Dubrovskii. *Vestn Khir Grekov* 99(10):41-46, 1967.

In 2439 patients (1477 men and 959 women) with various diseases of the stomach and bile ducts 1614 operations were performed (1299 on the stomach and 315 on the bile ducts). Acute postoperative pancreatitis was found in 32 patients (19%) with most frequent occurrence after surgery for cicatricial ulcerous stenosis (7) and stomach cancer (7). An important factor in the development of postoperative pancreatitis appears to be obstruction of the duct of Wirsung. Serum transaminase activity was most diagnostic. Treatment by insertion of a thin polyethylene catheter to irrigate the abdominal cavity with antibiotics or trasylol (in severe cases) and the use of blood transfusions, protein fluids and vasopressins reduced mortality from 50-80% to 22%.

4853 ABDOMINAL SURGERY IN THE PRESENCE OF ACUTE PANCREATITIS. *(E.)* Cohen, R. (Mayo Grad. Sch. Med., Rochester, Minn.), J. B. Priestley and J. B. Gross. *Mayo Clin Proc* 44(5):309-317, 1969.

Between 1962 and 1965, 30 patients (11 male and 19 female) with ages ranging from 4 to 81 yr were found to have acute pancreatitis at operation. Twenty-six were diagnosed as acute pancreatitis preoperatively, while in 4 the diagnosis was uncertain. In 21 of the 26 patients some abnormality of the biliary tract was diagnosed preoperatively and in 19 of these 21 it was thought that stones were present in either the gallbladder, the common bile duct, or both. Twenty-eight patients had acute edematous pancreatitis and 2 acute hemorrhagic pancreatitis at surgery. Nineteen of the 30 actually had biliary disease at surgery, 2 had acute postoperative pancreatitis, 1 had received blunt trauma, and in 8 there was no identifiable etiology. Twenty-one of the 30 had some biliary tract procedure performed. Two patients died and the 28 survivors had an average postoperative stay of 14.7 days.

4854 SHUNT OPERATIONS IN CHRONIC PANCREATITIS. *(Fr.)* Doutre, L. P. and J. Perissat. *Gaz Med France* 75(17):3557-3561, 1968.

Surgical intervention in chronic pancreatitis is mainly indicated by symptoms such as pain and malnutrition, although the surgical proceedure depends upon the anatomic and radiologic findings obtained by pancreatography. An intestinal shunt of retained gastric juice (voluminous pseudocyst, dilated Wirsung, pancreatic tract on which there were multiple small canalicular ectasis) was performed in 33 cases: 2 times for left pancreatitis; 31 times for right pancreatitis, localized or diffuse. There were 4 deaths. After 1 yr 21 of 23 reexaminated patients and after 3 yr 12 of 18 patients had satisfactory results. It is concluded that the pancreato-jejunal shunt is useful, mainly in avoiding injuries to a healthy left pancreas.

4855 ANATOMICAL AND CLINICAL STUDY OF TWO CASES OF ERYTHEMA NODOSUM APPEARING IN CHRONIC PANCREATITIS. *(Fr.)* Paris, J. (Clin. Dis. Digest. Tract, Lille, France), A. Gerard, M. Bombart-Thoreux, J. C. Paris and P. Merveille. *Lille Med* 13(10):1128-1132, 1968.

4856 CHRONIC PANCREATITIS – REPORT OF 36 CASES. *(Por.)* Dani R. (Fac. Med. U. Federal Minas Gerais, Belo Horizonte, Brazil) and C. E. D. Nogueira. *Rev Ass Med Minas Gerais* 19(2):145-150, 1969.

4857 A CLASSIFICATION OF CHRONIC PANCREATITIS. *(Rus.)* Trunin, M. A. (Leningrad Sanit.-Hyg. Med. Inst., USSR). *Vestn Khir Grekov* 99(9):60-65, 1967.

4858 PSEUDOCYSTIC PANCREATITIS. *(Rus.)* Volkova, L. P. (Leningrad Sanit. Hyg. Med. Inst., USSR). *Vestn Khir Grekov* 99(9):65-69, 1967.

4859 POSTOPERATIVE PANCREATITIS. *(Rus.)* Toskin, K. D. (Crimean Med. Inst., Simferopol, USSR) and D. S. Myrkin. *Vestn Khir Grekov* 99(11):73-77, 1968.

LIVER AND BILIARY TRACT
GENERAL

4860 **CLINICAL ASPECTS OF HEPATO-PORTAL CIRCULATORY DISORDERS.** *(Rus.)* Mansurov, Kh. Kh. (Inst. Gastroent., Tadzhik Acad. Sci., Dushanbe, TSSR). *Ter Arkh* 40(3):5-14, 1968.

Methods of hepatosplenomanometry and splenoportography were used to study the hepatoportal circulation in different diseases of the liver, (e.g. hepatitis, cirrhosis, tumor and granulomatous lesions, obesity, hemochromatosis), in 1555 patients. Simultaneous determinations of intraportal and intrasplenic pressure, together with splenoportographic findings, permitted the differentiation of intraportal parasinusoidal hypertension from intraportal presinusoidal hypertension and to isolate patients in whom collateral vessels relieved the portal channel. Comparative study of portal sinusoid pressure in acute and chronic diffuse liver diseases in relation to the degree of morphological changes disclosed a slight rise in pressure in acute Botkin's hepatitis; average intraportal tension increases in accordance with the severity of the morphological changes in the liver. Little difference was noted in intraportal pressure in relation to the morphological type of cirrhosis. Disturbances of portal tension in cirrhosis can be attributed to reversible as well as irreversible changes in the liver. Some degree of portal hypertension is characteristic even in many other liver disorders in combination with wholly reversible changes. In obese patients portal pressure increases not so much as a result of fat accumulation as of a marked proliferation of mesenchymal elements. The decision to create a portacaval anastomosis should be made with great care, after conservative therapeutic techniques have been tried. The essential conditions for such surgery are 1) varicosity of the esophageal vein in patients who have experienced bleeding 2) esophageal varices even without bleeding if the gastric vein is also dilated and portal hypertension is great 3) hypersplenism in combination with actual or imminent esophageal bleeding. Side-to-side anastomosis is preferable due to its marked decompressant effect. Care should be taken to ensure that by such surgery the blood supply to the liver is not reduced.

4861 **LIVER FUNCTION DISORDERS IN HYPERTHYROIDISM.** *(Ger.)* Weber, S. (Med. U. Polyclin., Zurich, Switzerland). *Praxis* 57(1):2-8, 1968.

Between May, 1966 and July, 1967, 30 (20 with Basedows disease, 10 with toxic adenoma) untreated hyperthyroid patients (29-71 yr of age; 24 women and 6 men) were examined by routine liver function tests (SGOT, SGPT, bilirubin, Quick, serum iron, alkaline phosphatase, BSP, serum portein) for disorders of liver function. Results of liver function tests were normal in 15 patients, abnormal in 14 patients (other complications such as right decompensation, manifest diabetes mellitus, cholecystopathy and chronic alcoholism were excluded. (One case was eliminated because of ambiguous test results). Abnormal values were found most frequently with the BSP test (9 patients had values over 6%), alkaline phosphatase, SGOT and SGPT were less frequently elevated. After therapy only 5 of the 11 patients with abnormal test values showed a trend toward normal liver function; 6 patients showed mixed responses.

4862 **HEPATOMA IN UGANDA. A STUDY IN GEOGRAPHIC PATHOLOGY.** *(E.)* Alpert, M. E. (Makerere Med. Coll., Kampala, Uganda), M. S. R. Hutt and C. S. Davidson. *Lancet* 1(7555):1265-1267, 1968.

The incidence of hepatoma in Uganda was studied for 3-yr period, 1964-66. The Kampala Cancer Registry, the Makerere University College Medical School biopsy diagnostic service, and personal visits provided a total of 403 cases: 310 of which were pathologically proven and 93 clinically diagnosed. Age, sex, tribe, and area of residence factors were analyzed. When the 310 biopsy-proven cases were plotted on a population density map, obvious areas of low density appeared. However, when the 93 clinically diagnosed cases were added they tended to fill the gaps caused by physician bias against liver biopsy and necropsy procedures. The heptoma peake age was 35-45 yr and the male:female ratio 3.3:1. Significantly higher rate of heptoma incidence was found in the immigrants of the Bantu tribes from Rwanda, Burundi and 2 Nilohamitic tribes of the North East. Rates in other tribes were remarkably similar although dietary patterns and other ecological variables differed. Fungal contamination with carcinogenic metabolites (aflatoxin has been found in 40% of the foods tested in Uganda) may be a factor contributing to the high incidence of hepatoma.

4863 **AMEBIC ABSCESS OF THE LIVER. THE VALUE OF THE ISOTOPE HEPATOSCAN IN DIAGNOSIS AND MANAGEMENT.** *(E.)* Parmley, L. F. Jr. (Walter Reed Gen. Hosp., Washington, D. C.), T. Sheehy, G. S. Johnston and H. W. Boyce. *Med Ann DC* 37(1):1-9, 1968.

Sixteen patients infected with *Entamoeba histolytica* complicated by amebic abscess of the liver presented with symptoms of fever in 15, weight loss in 12, malaise in 12, chills in 11, diarrhea in 8, and pain (chest in 8, right upper quadrant in 9, shoulder in 6, and back in 1). The liver was tender in 13 and enlarged in 12 patients. Leukocytosis (15-38,000/ml) was present in 16 and anemia (hematocrit less than 36%) in 15, SGOT was elevated (53-190 units) in 10, alkaline phosphatase (above 17-93) in 11, BSP in 1, serum bilirubin elevated in 2. Liver scans were obtained 15-30 min following the i.v. injection of radioactive colloidal ^{198}Au (100 μC). Colloidal Au is concentrated in the reticuloendothelial cells of the liver. Anterior scans in all patients and lateral scans on most were done initially and at 2- to 6-week intervals until there was no evidence of an hepatic lesion. Diagnosis of amebic abscess of the liver is difficult unless the liver scintiscan is used. The disease responds well to medical treatment when diagnosed early.

4864 **LIVER TRANSPLANTATION IN MAN–I, OBSERVATIONS ON TECHNIQUE AND ORGANIZATION IN FIVE CASES.** *(E.)* Calne, R. Y. (King's Coll. Hosp., London, England) and R. Williams. *Brit Med J* 4(5630): 535-540, 1968.

The liver is extremely sensitive to ischemic damage; therefore, if human liver transplantation is to be successful it is essential to cool the liver within 15 min of death by infusing a chilled innocuous fluid through the portal vein. If this infusion is followed by one of a cold plasma-bicarbonate-dextrose solution, the liver can be kept at 4 C with little deterioration for 2 hr. Active collaboration between hospitals is essential. Five cases of liver transplantation are reported in detail. One patient was in severe liver failure and had an accessory liver graft in the splenic fossa after splenectomy. The donor was a 50-yr old woman who died of a head injury. There was a period of 1 hr in which the liver at 37 C was unperfused. The patient did not recover consciousness and necropsy showed severe congestion in the transplanted liver; histology of the transplant showed hemorrhage and areas of necrosis as well. This transplant was heterotopic. The second patient was a 10-month-old infant with biliary atresia and liver failure. The donor was a 2-yr-old child who died as a result of an upper respiratory tract infection. The liver was removed 22 min after death and was perfused with cold Hartmann's solution and then with plasma-bicarbonate-glucose solution. The patient died of cardiac arrest half an hour after operation. Three other patients developed good initial liver function. One survived 11 weeks; death was caused by a partial infarction of the liver arising in the recipient hepatic artery where it had been clamped during the operation. Another patient was discharged from hospital on the 17th postoperative day and has returned to work. The fifth patient died from sepsis 3 weeks after transplantation.

4865 OTOLARYNGOLOGICAL CHANGES IN PATIENTS WITH CHRONIC HEPATITIS AND CIRRHOSIS OF THE LIVER. *(Rus.)* Kalstein, L. I. (Tadzhik Inst. Gastroent., Dushanbe, USSR). *Zh Ushn Nos Gor Bolez* 28(4):69-73, 1968.

Changes in otolaryngological function were observed in 157 patients (51 with chronic hepatitis, 106 with cirrhosis of the liver): alterations of the mucous membranes of the mouth, the nose (27%) and the glottis (71%); more frequent nose bleeds (55%); hearing loss as evidenced by the reduction in hearing pure tones (35% in chronic hepatitis and 70% in cirrhosis of the liver) and disturbances of equilibrium (30%). The intensity of these disturbances was directly related to the primary disease process, and recovery of liver function paralleled recovery of otolaryngological function. Local treatment of ear, nose and throat symptoms was ineffective.

4866 EFFECT OF PENICILLAMINE ON FAILURE OF RENAL ACIDIFICATION IN WILSON'S DISEASE. *(E.)* Walshe, J. M. (U. Cambridge, England). *Lancet* 1(7546):775-779, 1968.

Ten patients (7 males and 3 females, aged 10-43 yr) with Wilson's disease of 0-20 yr duration, who had received little or no treatment, were investigated as to the ability of the kidney to secrete an acid urine and to form ammonia after an ammonium load test. In only 2 patients was urinary pH below 6.22 (the group mean pH was 6.41). There was a corresponding inability to form ammonia. After 1 or more yr of treatment with penicillamine all showed improvement and the mean minimum urine pH was 5.22. Ten additional patients were tested for the first time from 1 to 10 yr after the start of treatment and the findings were similar: the mean minimum urine pH was 5.21. The ability of penicillamine to reverse hepatic and other lesions of Wilson's disease may stem from its ability to chelate copper and promote its rapid excretion in the urine.

4867 DEVELOPMENT AND COURSE OF EXTRAHEPATIC PORTAL OBSTRUCTION IN CHILDREN. *(E.)* O'Donnell, B. (Child. Res. Ctr., Dublin, Ireland) and M. A. Moloney. *Lancet* 1(7546):789-791, 1968.

Extrahepatic portal obstruction was studied in 15 children (9 male, 6 female). Seven presented symptoms of hematemesis, 4 of melena, 1 of anemia, 2 of diarrhea, and 1 of splenomegaly. Liver function tests (thymol turbidity, serum alkaline phosphatase, SGOT, SGPT, and prothrombin time) were normal in all. The only chemical abnormality was elevated bilirubin (8.2 mg/100 ml) and low albumin (2 g/100 ml) in 1 patient. Percutaneous liver biopsy was not performed routinely in this series, but of 11 surgically treated, liver biopsies were taken in 10: all were normal. Barium swallow revealed esophageal varices in 9, and 1 more on esophagoscopy. The diagnosis was confirmed in 13 by percutaneous splenic portography. Exchange transfusion for Rh incompatibility was the etiology in 1 patient and septicemia during the neonatal period in 4 patients. No case resulted from local umbilical sepsis. Follow-up has been for 1-4 yr with an average of 2¾ yr. Eleven of 15 have had surgery for repeated exsanguinating hemorrhages. Of 2 treated by splenorenal shunt, 1 has had a single episode of hepatic coma. They are otherwise well and free of hemorrhage. Of 8 treated by portoazygos disconnection, 3 have died and 4 have had recurrent hemorrhages; 2 had anastomotic leaks, 1 of which was responsible for death. This procedure is being abandoned. One child treated by transection of the esophagus is well 9 months after operation. Four patients were treated conservatively: 1 is dead of recurrent hemorrhages, 1 has had recurrent hemorrhages, and 2 are well. In summary, 4 of 15 have died and 5 others continue to have serious recurrent hemorrhages.

4868 SEVERE ZINC DEFICIENCY IN MALE AND FEMALE RATS. *(E.)* Swenerton, H. (Dept. Nutr., U. California, Davis) and L. S. Hurley. *J Nutr* 95(1): 8-18, 1968.

Severe zinc deficiency was induced in male and female Sprague-Dawley weanling rats by feeding them a diet from which the zinc had been reduced by treatment of the soybean protein with tetrasodium salt of ethylenediaminetetraacetic acid (Na_4EDTA). The basal zinc-free ration contained 0 ppm zinc as determined by X-ray fluorescence spectrometry, with an error of ± 2 ppm. (Analysis by atomic absorption spectrophotometry showed that the diet contained 0.20 ± 0.01 ppm of zinc.) Zinc supplemented animals received the same basal diet plus enough zinc carbonate to provide a total content of 1, 40, 60, or 100 ppm of zinc. Extreme care was taken to eliminate sources of zinc in the environment as well as in the diet; e.g., stainless steel, glass, or plastic was used throughout. The animals were weighed 3 times weekly and examined for signs of deficiency. After 4 or 6 weeks, rats were sacrificed for tissue analyses. Pyridoxal phosphokinase, lactic dehydrogenase, and glutamic dehydrogenase activities were assayed in the liver. Zinc and ash contents were determined in the femur. Extreme growth retardation was observed in rats fed the diet containing no zinc, With 1 ppm zinc added the growth of deficient rats was improved slightly but was still below controls. Rats fed the +40 ppm zinc diet had growth rates slightly below those fed stock feed. Control rats fed diets with 60 or 100 ppm zinc were not significantly different from stock-fed rats. Deficient animals showed immature hair coats, fissures at the corners of the mouth, and scaly feet. With progressive deficiency these became more severe and alopecia and dermal lesions appeared. Deficient rats had lower liver weights than those fed a diet containing 40 ppm zinc. There was no significant difference in liver pyridoxal phosphokinase activity on the basis of either liver weight or supernatant protein between the deficient and control groups. There was also no significant difference in the activity of glutamic dehydrogenase. However, lactic acid dehydrogenase activity was significantly lower in the livers of deficient rats than in those fed the control diet (100 ppm zinc). This decrease was also found in the livers of pair-fed controls.

4869 CONTINUOUS INTRAPORTAL INFUSION OF CHEMICALS THROUGH THE UMBILICAL VEIN IN MALIGNANT TUMORS OF THE LIVER. *(Rus.)*

Ostroverkhov, G. Ie. (2nd Moscow Med. Inst., USSR) and A. D. Nikol'skii. *Vop Onkol* 14(5):26-34, 1968.

Merphalan, thio-TEPA and 5-fluorouracil were intraportally infused (via the umbilical vein) in 46 patients (27 men and 19 women, aged 37-64 yr) with primary or metastatic liver cancer (diagnosed by laparotomy, angiography and biopsy). Six patients with hepatocellular primary liver cancer, 2 patients with cholangiocellular liver cancer and 2 patients with liver sarcoma were given merphalan or thio-TEPA in total doses of 0.2 g during 7-30 days; 36 patients with cancer metastatic to the liver received a total dose of 5 g of 5-fluorouracil during 7-30 days. The 10 patients with primary liver cancer and sarcoma lived an average of 9 more months. Of the 36 patients with metastatic cancer 14 showed remission of the malignant process and had life prolonged for 7.5 months. The remaining 22 died earlier.

4870 LIVER RESECTION IN THE TREATMENT OF BLUNT INJURIES TO THE LIVER. *(E.)*

Aronsen, K. F. (Dept. Surg., U. Hosp., Göteborg, Sweden), S. Bengmark, S. Dahlgren, L. Engevik, B. Ericsson and L. Thoren. *Surgery* 63(2):236-246, 1968.

Nine patients (7 males, 2 females) with extensive liver injury were subjected to liver resections. All but 2 were involved in car accidents. Eight of the 9 patients arrived at the hospital within 1 hr after injury and all but 1 were operated upon within 3 hr. All were conscious when they arrived at the hospital, 5 were in shock. A right lobectomy was performed in 5, left lobectomy in 2, and left segmental resections in 2. In 1, a left lobectomy was combined with ligation of the right hepatic artery. Of the 9 patients who underwent surgery, 4 died. The operative findings which distinguished these 4 cases the others were tears in the main hepatic veins or inferior vena cava. Changes in serum lipids were studied postoperatively in 1 patient: phospholipids, cholesterol, triglycerides, and free fatty acids were significantly decreased. In 1 patient whose liver circulation was studied, the liver plasma flow was 0.7 and 0.6 liters/min and the estimated liver blood flow 1.1 and 0.9 liters/min 1 and 5 weeks after the operation, resp. The hepatic venous pressure was measured in 1 patient postoperatively: the wedge position pressure was 12 and in free position 7.5 cm H_2O at 1 week and 6 and 4 cm H_2O, at 5 weeks resp. The BSP retention time in 1 patient was 35, 30, and 10% after 12, 22, and 25 days, resp. Liver scanning with radiogold was performed in 2 patients: the liver was not restored to normal size 6 months after operation. In one patient hepatic angiogram, portogram, and second-look operation (at the time of incisional hernia repair) were performed 1 yr after liver resection. The left lobe had increased enormously in size and had become as large as a normal liver. The space where the right lobe had been, been, remained empty.

4871 PRIMARY HEPATOMA IN UGANDA. *(E.)*

Alpert, M. E. (Harvard Med. Sch. Boston, Mass.), M. S. R. Hutt and C. S. Davidson. *Amer J Med* 46(5):794-802, 1969.

Over a 9 month period in Uganda, 46 patients with primary hepatoma were studied. This represented 2.1% of all medical admissions. The peak age was 25-45 yr and the male to female ratio was 2:1. Predominant findings were: abdominal pain, hepatomegaly with a hard, frequently tender mass in the right upper quadrant, and rapid clinical deterioration over a period of several months. Jaundice, fever, hepatic coma and other signs of hepatocellular disease were infrequent, but an unexplained hypercholesterolemia was noted in 1/3 of the patients. Bloody ascites occurred in 19% and acute hemoperitoneum in 15%. Clinical diagnoses without histology were correct in 86%. The disease was more common in poorer immigrants, but there was no significant difference in medical, nutritional or alcoholic histories.

4872 SCINTIGRAPHY AND ANGIOGRAPHY IN DEMONSTRATION OF HEPATIC TUMORS. *(E.)*

Bartley, O. (Dept. Radiother., Sahlgrenska Sjukhuset, Gothenburg, Sweden), C. G. Helander, B. Rosengren and S. Stattin. *Acta Radiol* 8(2):161-167, 1969.

Scintigraphy using ^{198}Au and aortography using Urograffin 60% were performed on 30 adults, 19 with verified primary hepatic tumors or metastases and 11 without. None of the patients without hepatic neoplasms had positive angiography, but 2 had positive scintigraphy; both had cirrhosis. Expansive processes were demonstrated by angiography in 16 of 19 patients with hepatic neoplasms and in 11 of 19 scintigraphy. Where there was increased vasculature, as in primary tumors or in some metastases, angiography was accurate in all 11 cases as compared to the 6 of 11 with scintigraphy. The 2 methods were equally accurate (5 of 8) when tumor vessels were not abundant.

4873 A LIPOPROTEIN CHARACTERIZING OBSTRUCTIVE JAUNDICE. I. METHOD FOR QUANTITATIVE SEPARATION AND IDENTIFICATION OF LIPOPROTEINS IN JAUNDICED SUBJECTS. *(E.)*

Seidel, D. (U. Oklahoma Sch. Med., Oklahoma City), P. Alaupovic and R. H. Furman. *J Clin Invest* 48(7):1211-1223, 1969.

Three immunochemically and electrophoretically distinct lipoproteins, LP-A, LP-B, and LP-X, were isolated from the low density lipoprotein fraction (1.006-1.063 g/ml) in plasma from patients with biliary obstruction by a separation procedure (described in detail) which combines ultracentrifugation, heparin precipitation, and ethanol fractionation. The quantitative determination of individual plasma lipoprotein families on the basis of their protein moieties rather than on the basis of their lipid moieties or density is thus made possible. The chemical composition of the unique lipoprotein, LP-X, is similar to that of an abnormal lipoprotein, OLP, isolated by Russ *et al.* *(J Clin Invest* 35:133, 1956*)*. In obstructive jaundice plasma the combined LP-X and LP-B accounted for 98% and the LP-A for only 2% of the total protein content of the low density lipoprotein fraction. The plasma lipoprotein pattern in obstructive jaundice is characterized by (a) a decreased concentration of high density lipoprotein, (b) an increased concentration of low density lipoprotein, and (c) the presence in the low density lipoprotein fraction of varying amounts of a specific lipoprotein, LP-X, immunochemically and chemically distinct from LP-A and LP-B. LP-X, with its characteristically high content of unesterified cholesterol and phospholipids, is primarily responsible for the unusual protein and lipid content of the low density lipoprotein fraction. Screening tests in 61 patients with various forms of jaundice indicated that a characteristic immunoelectrophoretic precipitin are between plasma samples and purified antibodies to LP-X was observed only in patients with obstructive jaundice. This simple immunochemical test may be useful in the differential diagnosis of obstructive and nonobstructive jaundice.

4874 CONJUGATED AND UNCONJUGATED SERUM BILE ACID LEVELS IN PATIENTS WITH HEPATOBILIARY DISEASES. *(E.)*

Makino, I. (Hokkaido U. Sch. Med., Sapporo, Japan), S. Nakagawa and K. Mashimo. *Gastroenterology* 56(6):1033-1039, 1969.

Total and unconjugated bile acid levels in serum of patients with various hepatobiliary diseases were determined by gas-liquid chromatography. In normal serum, ranges of total serum bile acid were found as follows: deoxycholic acid 0.22 ± 0.14, chenodeoxycholic acid 0.23 ± 0.14, cholic acid 0.14 ± 0.09, and total amount of bile acid 0.59 ± 0.31 μg/ml. The cholic to chenodeoxycholic acid ratio (C:CDC) was 0.61 ± 0.30. In hepatobiliary diseases, the level of total serum bile acid rose. The increase was remarkable in acute early hepatitis and in obstructive jaundice but moderate or slight in active portal cirrhosis and chronic hepatitis. Changes in the composition of serum bile acid were also observed. The C:CDC ratio was 1.01 ± 0.43 in portal cirrhosis and 2.74 ± 1.42 in obstructive jaundice. A correlation was observed between the total serum bile acid level and the serum bilirubin concentration in obstructive jaundice and portal cirrhosis. Unconjugated serum bile acid levels in healthy persons showed a range of 0.26 ± 0.20 μg/ml; and the unconjugated to total bile acid ratio (U:T) was 51.4 ± 22.0%. In active portal cirrhosis, the amount of unconjugated bile acid increased (2.54 ± 1.83 μg/ml). The value was significantly higher than that in normal, chronic hepatitis, and obstructive jaundice groups. In contrast to portal cirrhosis, the entire increase in serum bile acid in obstructive jaundice was limited to conjugated bile acid and the U:T ratio was very low (0.2 ± 0.4%).

4875 INTRAPARENCHYMAL ANGIOGRAPHY IN THE DIAGNOSIS OF HEPATIC VENO-OCCLUSIVE DISEASES. *(E.)*

Ramsay, G. C. (Coll. Phys. Surg., Columbia U., New York, N. Y.) and R. C. Britton. *Radiology* 90(4):716-726, 1968.

Percutaneous hepatic phlebography was performed in 22 patients: 6 were being subjected primarily to percutaneous cholangiography; 8 were being studied to determine the patency of portacaval shunts, and 8 to determine the patency of the hepatic veins. No serious complications occurred. Morbidity was limited to right upper quadrant, pleuritic, and referred right neck pain in 3 patients in whom injections were made near the hepatic capsule. Pain subsided when the injection pressure ceased. Operative liver biopsies of the areas into which contrast medium had been injected ½ hr-10 days earlier showed no inflammation or necrosis. Thrombotic, neoplastic, and membraneous obstructions of the hepatic veins and vena cava were demonstrated in 7 patients in whom retrograde catheterization, caval phlebography, splenoportography, needle biopsy of the liver, and isotopic liver scan had failed to indicate the nature or location of the obstruction. No serious complications were seen when specific contraindications (e.g., known sensitivity to iodine, coagulation dyscrasias with prolongation of the clotting time, significant ascites, and an irrational or uncooperative patient) to performing the procedure were observed.

4876 COMPARATIVE STUDY OF PRIMARY LIVER CARCINOMAS IN EUROPE AND IN AFRICA.

(Fr.) Sankalé, M. (Inst. Med. Pharm., Dakar, Senegal), B. Diop and A. M. Sow. *Bull Soc Med Afr Noire Lang Franc* 13(3):565-576, 1968.

In Europe as in Africa primary liver carcinoma occurs, histologically, mainly as a hepatoma. Liver cancer is increasing in Europe, but the higher incidence in Africa suggests the influence of racial factors. The higher incidence in males is more marked in Africa (6 males:1 female) than in Europe (2 males: 1 female). In Africa the patients are younger (35 yr) than in Europe (60 yr). While in both geographical areas primary liver carcinoma is consequent to cirrhosis, which in Europe is mainly alcoholic and in Africa meta-icteric. In Europe, primary liver carcinoma is an *in situ* cancer identified only by autopsy; in Africa, it is a proliferant cancer of rapid evolution.

4877 DOES MOLYBDENUM PLAY A ROLE IN WILSON'S DISEASE? *(Fr.)*

Galli, A. (Salpêtrière Hosp., Paris, France). *Ann Biol Clin* 26(7-9):975-978, 1968.

Urinary molybdenum content and the ratio of excreted copper and molybdenum in subjects affected by Wilson's disease were determined. Results, obtained by means of colorimetric technique, showed that in normal subjects the elimination of molybdenum during 24 hr varied between 0-43 μg, with an average of 15.6 μg; in the subjects with Wilson's disease the values ranged from 0-5 μg, with an average of 1.9 μg/24 hr. A constant ratio of copper and molybdenum excretion was confirmed only in normal subjects. A study of the interrelationships of copper and molybdenum metabolism in the man could yield interesting therapeutic results.

4878 PRIMARY LIVER CARCINOMA IN BRISBANE. *(E.)*

Lane, D. (Mater Misericordiae Hosp., Brisbane, Australia). *Med J Aust* 1(15):764-767, 1969.

A series of 27 cases (18 male, 9 female, with the greatest number in their sixth and seventh decades) of primary liver carcinoma were analyzed. There were 25 cases of hepatocarcinoma and 2 of cholangiocarcinoma. Venous invasion occurred in 8 cases, and the disease was associated with cirrhosis (8 cases), hemochromatosis (2), and peptic ulcer (3). The most common presenting symptoms were epigastric or right upper quadrant pain (14 cases) and weight loss and anorexia (9). Eighteen patients received symptomatic therapy, 3 underwent radical hepatectomy, 3 were given 5-fluorouracil systemically, 2 were subjected to a bypass procedure and 1 was given deep X-ray therapy. Difficulty was noted in distinquishing hepatomas from Riedel's lobe, nonneoplastic biliary tract obstruction, amoebic abscess, and even infectious hepatitis. The problem of differentiating benign from malignant liver tumor is discussed.

4879 ACTIVE CHRONIC HEPATITIS AND RECURRENT AND PERSISTENT HEPATITIS IN SINGAPORE PATIENTS. *(E.)* Fung, W. P. (Dept. Clin. Med., U. Singapore) and O. T. Khoo. *Med J Aust* 2(2):84-89, 1969.

Clinical, biochemical and histological features of 10 patients (7 female, 3 male; 11 to 66 yr) with active chronic hepatitis are compared with those of 14 patients (3 female, 11 male; 18 to 58) with recurrent and persistent hepatitis. Active chronic hepatitis often manifested itself with anorexia, jaundice and hepatomegaly, and was associated with a fairly high incidence of splenomegaly, spider nevi, liver palms, ascites, hepatic coma and gastrointestinal bleeding; it was frequently associated with a markedly prolonged prothrombin time and raised thymol turbidity; hypoalbuminemia, hyperglobulinemia, hypergammaglobulinemia, elevated SGPT levels, and a high mortality rate. Characteristic histological abnormalities of the liver were: marked piecemeal necrosis with rosette formation, portal tract infiltration by plasma cells and lymphocytes and a high incidence of nodular regeneration with progression to cirrhosis. Steroid therapy had no effect on 4 patients who died, but gave some improvement in the remaining 6. In contrast, recurrent and persistent hepatitis was a relatively benign disease, with absence of hypoalbuminemia, hyperglobulinemia and hypergammaglobulinemia. The liver biopsy material was typical of acute viral hepatitis. Liver histology alone is usually sufficient to distinguish between active chronic hepatitis and recurrent and persistent hepatitis.

4880 LIVER DISEASE AND EXOCRINE PANCREATIC FUNCTION. *(E.)* Forell, M. M. (2nd Med. Div., U. Munich, Germany), H. Stahlheber and M. Otte. *German Med Monthly* 12(10):465-468, 1967.

Pancreatic function was evaluated in normal subjects and 77 patients (58 males and 19 females) with liver disease: 25 chronic hepatitis, 11 cirrhosis, 10 intrahepatic cholestasis, 23 fatty liver, 1 hemochromatosis, 1 cardiac liver, and 1 carcinoma of the liver and in normal subjects. Pancreatic secretion was stimulated as follows: pancreozymin and secretin 1 U/kg each i.v.; 2 U/kg pancreozymin and 1 U/kg secretin; 2 and 4 U/kg/hr pancreozymin by i.v. infusion; 6 g of ox bile in 20 ml H_2O intraduodenally; 6 g of ox bile intraduodenally, and 1 U/kg pancreozymin and secretin each i.v. Side effects encountered were minimal. Occasionally there was nausea or slight abdominal pain, but no irritation of the intestinal mucosa. Increased as well as reduced pancreatic function was observed. In contrast to findings in chronic pancreatitis, secretory insufficiency was often confined to enzyme output. There may be a selective damage to pancreatic acini with preservation of tubular epithelial function. Secretory volume and bicarbonate excretion were found to be inadequate measures of pancreatic function in liver disease. An increase in the quantity of pancreatic juice excreted should suggest parenchymal liver damage.

4881 MASSIVE CAVERNOUS HEMANGIOMA OF THE LIVER. CASE REPORTS AND REVIEW OF THE LITERATURE. *(E.)* Ecker, J. E. (Santa Barbara County Gen. Hosp., Calif.) and W. A. Doane. *Amer J Gastroent* 52(1):25-36, 1969.

4882 THE IMPACT OF DIURETICS ON CHRONIC LIVER DISEASE. *(E.)* Steigmann, F. (Cook County Grad. Sch., Chicago, Ill.) and R. Mejicano. *Amer J Gastroent* 52(1):37-44, 1969.

4883 TREATMENT OF GLYCOGEN STORAGE DISEASE (VON GIERKE'S DISEASE). *(Rev.)(E.)* Spellberg, M. A. (U. Illinois Sch. Med., Chicago). *Amer J Gastroent* 52(1):45-47, 1969.

4884 PORPHYRIA AND PREGNANCY. *(E.)* Zilliacus, H. (U. Cent. Hosp., Helsinki, Finland). *Ann Chir Gynaec Fenn* 56(3):349-353, 1967.

4885 ELECTROCARDIOGRAPHIC AND CLINICAL ASPECTS OF LIVER PATHOLOGY. *(It.)* Scalise, G. (Inst. Gen. Clin. Med., U. Siena, Italy), A. Fedi and C. A. Boggiano. *Rass Int Clin Ter* 48(22):1371-1390, 1968.

4886 HEPATOLENTICULAR DEGENERATION TREATED WITH PENICILLAMINE WITH A GOOD RESULT. *(Fr.)* Petit, H. *Lille Med* 13(10):1132-1134, 1968.

4887 HUMAN LIVER ULTRASTRUCTURE IN A CASE OF CRIGLER-NAJJAR SYNDROME. *(Fr.)* Minio-Paluello, F. (Ctr. Electron Microscopy, U. Lausanne, Switzerland), A. Gautier and P. Magnenat. *Acta Hepatosplen* 15(2):65-71, 1968.

4888 CHOLANGITIS WITH HYPOTONIA OF THE COMMON DUCT. *(Fr.)* Razemon, P., M. Heraud, Delobelle-Deroide and B. Filoche. *Lille Med* 13(10):1139-1140, 1968.

4889 CATHETERIZATION OF THE UMBILICAL VEIN: A NEW TECHNIQUE FOR FILTRATION OF PORTAL BLOOD IN SCHISTOSOMIASIS. *(Por.)* Correa Lima, M. B. (Found. Sch. Med. Surg., Rio de Janeiro, Brazil), J. L. Caboclo and S. A. Ribeiro. *Folha Med* 56(2):243-248, 1968.

4890 REPEATED SURGICAL INTERVENTIONS ON THE LIVER. *(Rus.)* Shapkin, V. S. (Med. Inst., Vladivostok, USSR) and V. A. Zhuravlev. *Klin Khir (Kiev)* (12):6-9, 1968.

4891 SURGICAL TREATMENT OF PRIMARY CANCER OF THE LIVER. *(Rus.)* Burka, A. A. (Med. Inst., Kiev, USSR). *Klin Khir (Kiev)* (12):65-66, 1968.

4892 TOTAL OBSTRUCTION OF THE INTRAHEPATIC BILIARY DUCTS BY A CAST COMPOSED OF DEHYDRATED BILE. *(Fr.)* Gautier-Benoît, C., A. Dupont, J. C. Paris, P. Merveille and J. Paris. *Lille Med* 13(10):1135-1138, 1968.

LIVER AND BILIARY TRACT

4893 LIVER FUNCTION TESTS IN UNDERNOURISHED CHILDREN DURING TREATMENT WITH ANATROFIN (STENOBOLONE ACETATE). *(Sp.)* Amor Villalpando, A. (Moctezuma Child. Hosp., Mexico City, Mexico), L. Bernal Diaz and J. Silva Baeza. *Medicina (Mex)* 48(1034):194-197, 1968.

4894 A LOOK AT 8 CASES OF ANGIOMA OF THE LIVER. *(Fr.)* Ghossain, A. (Zahle, Lebanon). *Bull Soc Int Chir* 27(3):229-235, 1968.

4895 METHODS OF HEMOSTASIS IN LIVER RESECTIONS. *(Rus.)* Voitenko, A. A. (Kiev Med. Inst., USSR). *Klin Khir (Kiev)* (5):24-27, 1968.

4896 HEPATIC AMOEBIASIS: COMMON SYMPTOMATOLOGY AND SIGNS. *(E.)* Dalvi, S. G. (K. E. M. Hosp., Bombay, India). *Indian Pract* 21(12):895-890, 1968.

4897 THE OXYGEN GRADIENT AND HEPATIC BLOOD FLOW IN HEPATOSPLENIC SCHISTOSOMIASIS MANSONI, SYMMER'S FORM. *(Por.)* Ribiero Jorge, P. A. (Med. Fac., U. Campinas, Brazil), W. Zancaner, R. F. Guimarães and S. dos Santos Carvalhal. *Rev Ass Med Brasil* 13(12):442-445, 1967.

4898 THE INTRAHEPATIC VASCULAR NET IN SYMMERS' FORM OF SCHISTOSOMIASIS MANSONI; A STUDY WITH PLASTIC MODELS. *(Por.)* Ribeiro Jorge, P. A. (Med. Fac., U. Campinas, Brazil) and S. dos Santos Carvalhal. *Rev Ass Med Brasil* 13(12):435-441, 1967.

4899 A SIMPLIFIED METHOD FOR THE ANATOMICAL EXCISION OF THE LATERAL SEGMENT OF THE LEFT LIVER LOBE. *(Pol.)* Jesipowicz, M. (1st Surg. Clin., Acad. Med., Lublin, Poland). *Pol Przegl Chir* 39(9):920-925, 1967.

4900 RARE CAUSES OF NEONATAL JAUNDICE. *(It.)* Cordone, G. (G. Gaslini Pediat. Clin., U. Genoa, Italy), C. Borrone, L. Massimo, L. Famularo and P. Moscatelli. *Minerva Pediat* 19(27):2223-2226, 1967.

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4902 A CLINICAL AND BIOLOGICAL STUDY OF THE ACTION OF A NEW DRUG ON JAUNDICE. *(Fr.)* Ribet, A. (Fac. Med., U. Toulouse, France) and M. Hardy. *Sem Ther* 43(9):534-536, 1967.

4903 LIVER DISTURBANCES IN DIABETES. *(Pol.)* Kubicki, S. (Gastroent. Clin., Med. Acad., Warsaw, Poland). *Pol Tyg Lek* 24(2):60-63, 1969.

4904 SYNDROME OF CHRONIC IDIOPATHIC DYSPROTEINEMIA. *(Cz.)* Petera, V. (Fac. Gen. Med., Charles U., Plzen, Czechoslovakia). *Cesk Gastroent Vyz* 23(3): 125-129, 1969.

4905 INFLUENCE OF FAT ADMINISTRATION ON SERUM ALKALINE PHOSPHATASE IN HEPATIC DISEASES IN THE HUMAN. *(Jap.)* Ono, T. (Yawata Seitetsu Hosp., Kitakyushu, Japan), K. Ito and K. Tanaka. *Med Biol (Tokyo)* 78(6):251-255, 1969.

4906 ANALYSIS OF A GROUP OF CHILD CONVALESCENTS AFTER INFECTIOUS HEPATITIS. PRELIMINARY EXPERIENCE WITH THE EVALUATION OF THE CATHEPSIN INDEX IN SCHOOL CHILDREN. *(Cz.)* Kuncová, Z. (Med. Fac., Charles U., Prague, Czechoslovakia), L. Havlůjová-Zukrieglová and J. Homolka. *Cesk Pediat* 24(4):312-318, 1969.

4907 ACCESSORY LOBE OF LIVER PRESENTING SYMPTOMS OF PELVIC TUMOR. *(E.)* Levi, M. M. (Columbia U. Coll. Physicians and Surgeons), L. C. Creque and S. Cinque. *New York J Med* 69(10):1334-1336, 1969.

4908 RECURRENT JAUNDICE DUE TO INTRAHEPATIC CHOLESTASIS IN PREGNANCY: DESCRIPTION OF A CLINICAL CASE. *(It.)* Secchi, G. C. (L. Devoto Lab. Clin., U. Milan, Italy) and A. Rezzonico. *Arch Ital Mal Appar Dig* 35(4):330-344, 1969.

4909 PRIMARY CARCINOMA OF THE LIVER. [CASE REPORT] *(Por.)* Alves, J. B. R. (Fac. Med., U. Fed. Minas Gerais, Belo Horizonte, Brazil) and L. A. R. de Oliveira. *Rev Ass Med Minas Gerais* 19(2):157-160, 1969.

4910 A CASE REPORT OF APLASTIC ANEMIA AFTER ACUTE HEPATITIS. *(Kor.)* Nam-Koong, S. (Coll. Med., Seoul Natl. U., Korea), J. O. Lee, S. J. Chang, S. I. Kim and H. I. Cho. *Korean J Intern Med* 12(3):217-222, 1969.

4911 LIVER TRANSPLANTATION IN MAN. FIRST RESULTS AND PROSPECTS. *(Fr.)* Chapuis, Y. *Presse Med* 77(6):203-206, 1969.

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4915 THE BUDD-CHIARI SYNDROME. *(Por.)* Corrêa Lima, M. B. (Sch. Med., Fed. U. Rio de Janeiro, Brazil), C. J. Serapião and S. A. Ribeiro. *Arq Brasil Med* 54(4):311-321, 1967.

4916 CORRELATIONS BETWEEN HEPATO-BILIARY DISORDERS, PANCREATIC EXOCRINE FUNCTIONS AND DIABETES MELLITUS. *(Fr.)* Strimbu, I. (Cluj, Romania). *Rev Intern Hepat* 17(7):651-660, 1967.

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4921 EXPERIENCE WITH TWENTY-SIX HEPATIC LOBECTOMIES AND EXTENSIVE HEPATIC RESECTIONS. *(E.)* Dillard, B. M. (Washington U. Sch. Med., St. Louis, Mo.). *Surg Gynec Obstet* 129(2):249-257, 1969.

4922 JAUNDICE, ASCITES, AND HEPATOMEGALY. RECURRENCE IN CHINESE MALE. [CASE REPORT] *(E.)* Anonymous. *New York J Med* 69(11):1405-1418, 1969.

4923 CLINICAL STUDY OF 4-AMINO-5-IMIDAZOLE-CARBOXAMIDE OROTATE (AICA) IN HEPATITIS AND CIRRHOSIS. *(Fr.)* Chanoine, F. *Acta Gastroent Belg* 32(4-5):383-395, 1969.

See also: 4275,4280,4283,4318,4444,4465,4482,4496,4542,4545,4549,4551,4553,4554,4555,4562,4569,4570,4572, 4574,4579,4580,4582,4594,4595,4748,4821,4834,4930

Hepatic Injury

4924 HEPATITIS OF NEONATAL RUBELLA. *(Fr.)* Alagille, D. (Hôpital Parrot, Paris, France), E.-C. Habib, M. Gautier, A. Boue and S. Kocher. *Arch Franc Pediat* 25(4):393-414, 1968.

In all the cases studied, mothers came in contact with rubella virus during pregnancy. Etiologic inquiries did not furnish definite information. In 2 cases, rubella was rediscovered. In the 1st case (20th week of pregnancy), it was too late to do a rubella embryopathy. Histological studies show that all 3 cases had in common a hepatic attack, clinically revealed through hepatomegaly; retentional jaundice (2 cases), and 1 history characteristic of hepatitis. The incidence of hepatitis is connected with rubella infection during pregnancy. In all 3 cases of neonatal hepatitis the rubella etiology was established by isolation of the virus in cephalo-rachidic liquid (1); rhinopharyngeal retention (3); and hepatic retention (1). However, the specific serology, positive in the mothers, was not present in the infants.

4925 SECONDARY GASTROINTESTINAL BLEEDING AFTER CLOSED LIVER TRAUMA IN CHILDREN. *(Rus.)* Finkel'son, Ie. I. (Timiryazev Munic. Child. Hosp. No. 20, Moscow, USSR), E. B. Vernekin and S. P. Mironov. *Vestn Khir Grekov* 99(8):105-107, 1967.

4926 ECHINOCOCCOSIS OF THE LIVER AND ITS PECULIARITIES IN CHILDREN. *(Rus.)* Akhundov, N. Iu. (Narimanov Med. Inst., Baku, Azerbaijan, USSR). *Khirurgiia (Moskva)* 44(7):69-72, 1968.

4927 LIVER ABSCESSES RESULTING FROM ASCARIS IN A 5-YEAR-OLD. *(Rus.)* Bushmelov, V. A. (Izhevsk Med. Inst., USSR) and G. Ia. Fominykh. *Khirurgiia (Moskva)* 44(7):136-138, 1968.

4928 DRUG-INDUCED HEPATITIS: THE ROLE OF HYPOGLYCEMIC SULFONAMIDES. (REPORT OF TWO CASES.) *(Fr.)* Geffroy, Y., M. Segrestin, J. Bourreille, J. Fablet and R. Colin. *Actualites Hepatogastroent Hotel Dieu* 4(5):B175-B186, 1968.

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4930 COMPLICATION FOLLOWING AMEBIC ABSCESS OF THE LIVER. *(Pol.)* Gruca, Z. (3rd Surg. Clin., Acad. Med., Gdansk, Poland), E. Szalach and Z. Wajda. *Pol Przegl Chir* 40(11):1391-1393, 1968.

4931 HYDATID CYST OF THE LIVER OPENING INTO THE BILE DUCTS. *(Sp.)* Varela, O. W., A. Mendez Anell and P. C. Arvia. *Prensa Med Argent* 55(29):1398-1401, 1968.

4932 THE INFREQUENT OCCURRENCE OF HYDATIDOSIS. *(Sp.)* Tanno, H. (Inst. Pathol. Anat., Centenary Natl. Hosp., Buenos Aires, Argentina), A. Reinaldo and C. Sapene. *Prensa Med Argent* 55(29):1393-1397, 1968.

4933 NEONATAL JAUNDICE DUE TO CHLORPROMAZINE. *(Fr.)* L'Hirondel, J. (Cent. Hosp., U. Caen, France), R. Venezia, P. Rousselot, F. Daridon and J. C. Fellouse. *Arch Franc Pediat* 25(10):1171-1177, 1968.

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4935 DDT-INDUCED METABOLIC CHANGES IN RAT LIVER. *(E.)* Sánchez, E. (U. Chile, Santiago). *Canad J Biochem* 45(7):1809-1817, 1967.

4936 THE USEFULNESS OF THE BROMOSULPHOPHTHALEIN TEST IN THE URINE IN THE DIAGNOSIS OF EARLY HEPATIC DAMAGE. *(Pol.)* Śliwiński, B. (Acad. Med., Warsaw, Poland). *Wiad Lek* 20(18):1709-1713, 1967.

4937 HEPATIC LESIONS CAUSED BY AUTOLOGOUS ANTIGENS AFTER 8 MONTHS OF TREATMENT. *(It.)* Agnolucci, M. T. (Inst. Gen. Med. Clin. Ther. Med., U. Modena, Italy) and M. Gallo. *Arch Ital Mal Appar Dig* 35(4):317-329, 1969.

4938 IMPAIRMENT OF LIVER FUNCTION RESULTING FROM SHOCK IN PATIENTS WITH SEVERE FRACTURES. *(E.)* Koskinen, E. V. S. (U. Cent. Hosp., Helsinki, Finland), H. Julkunen and K. Honkonen. *Ann Chir Gynaec Fenn* 56(3):296-303, 1967.

4939 TREATING CHOLANGITIS AND VARIOUS LIVER ABSCESSES BY ADMINISTERING ANTIBIOTICS INTO THE UMBILICAL VEIN. *(Rus.)* Nazarevskii, N. G. (Crimean Med. Inst., Simferopol, USSR), V. V. Izosimov and N. N. Volobuiev. *Vestn Khir Grekov* 99(9):117-118, 1967.

4940 ACUTE TOXICITY OF THE CHLORINATED HYDROCARBON INSECTICIDES. A CASE REPORT WITH COMMENTS ON TOXICOLOGY AND MANAGEMENT. *(E.)* Jacobs, P. (U. Witwatersrand, Johannesburg, S. Africa) and J. B. Lurie. *S Afr Med J* 41(44):1147-1150, 1967.

4941 A CASE OF JAUNDICE DUE TO 5-FLUOROURACIL. *(Pol.)* Hornowski, S. (Munic. Infect. Dis. Hosp. No. 1, Warsaw, Poland) and L. Olkowski. *Pol Tyg Lek* 22(40):1536-1537, 1967.

4942 HEPATIC COMA DUE TO FULMINATING HEPATITIS TREATED WITH EXTRACORPOREAL PIG-LIVER PERFUSION. [CASE REPORT] *(E.)* Abouna, G. M. (Royal Victoria Infirm., Newcastle upon Tyne, England), R. Garry, J. Kirkley and D. N. Walder. *Brit J Surg* 56(3):223-225, 1969.

4943 HEPATIC ABSCESSES OF AMEBIC ETIOLOGY. *(Bul.)* Vasilev, N. (Inst. Milit. Med., Sofia, Bulgaria) and A. Pinkas. *Khirurgiia (Sofiia)* 21(6):579-581, 1968.

See also: 4271,4311,4427,4445,4453,4455

Viral Hepatitis

4944 **THE EFFECT OF INFECTIOUS HEPATITIS ON THE EXOCRINE FUNCTION OF THE PANCREAS.** *(Rus.)* Moiseyenko, A. V. (Leningrad Sanit.-Hyg. Med. Inst., USSR). *Ter Arkh* 40(1):90-94, 1968.

Studies of exocrine pancreas function in 203 infectious hepatitis patients were made at various times during the disease as well as after treatment. Lypolytic, amylolytic, proteolytic and secretory functions were studied in addition to determining trypsin activity and its inhibitors in the blood. At the height of the disease lipase activity dropped, as did proteolase. Amylase decreased to a lesser degree. Less predictable were the rise in carbonate alkalinity and the drop in the volume of duodenal secretion. Disturbances in pancreatic function were observed in 80% of the patients. Even in mild cases normalization of exocrine function lagged behind clinical recovery from hepatitis. In plasma, trypsin and lipase activity increased: less pronounced and less predictable were variations in trypsin inhibitors and amylase. Because pancreatic dysfunction may continue after clinical recovery from hepatitis, drugs to restore normal activity are indicated as follow-up treatment for infectious hepatitis patients.

4945 **ABOUT THE RELIABILITY OF SOME TESTS PERFORMED TO FIND OUT THE CARRIERS OF THE HEPATITIS VIRUS, IN THE TRANSFUSIONAL PRACTICE.** *(It.)* Dazzi, L. (Istituti Ospitalieri, Verona, Italy), G. Canali and O. Ghidini. *Fracastoro* 60(4):549-558, 1967.

In a group of 60 periodic donors involved in 15 cases of post-transfusional hepatitis, the behavior of GOT, GPT, total bilirubinemia, Hanger's and MacLagan's tests were recorded. Abnormal GOT and GPT were found in 16 cases, abnormal GOT only in 4 cases and GPT only in 2. The GOT/GPT ratio was altered in 5 donors. Transaminase levels were higher than 100 U only in 4 cases for GOT and 2 for GPT. The same enzymatic tests determined in another 60 periodic donors considered as controls, showed: increased GOT and GPT in 15 cases, increased GOT only in 3, and GPT only in 2. GOT/GPT ratio was altered in 1 case. Transaminase values were higher than 100 U in 6 cases for GOT and 3 for GPT. At the present time there are no reliable tests to reveal carriers of B-hepatitis virus.

4946 **AN EPIDEMIC OF CLAM-ASSOCIATED HEPATITIS.** *(E.)* Ruddy, S. J. (Natl. Comm. Dis. Ctr., Publ. Hlth. Svc., Atlanta, Ga.), R. F. Johnson, J. W. Mosley, J. B. Atwater, M. A. Rossetti and J. C. Hart. *JAMA* 208(4):649-655, 1969.

During a 32-week period from Nov. 1963 through June 1964 an epidemic of 123 cases of viral hepatitis occurred in Conn. Several observations supported the incrimination of raw clams as the vehicle: a high proportion of cases among adult males, a low proportion of patients having contact with a previous case, the occurrence of cases in two epidemic waves, the similarity between the known incubation period of infectious hepatitis and the interval from consumption of the raw clams to onset of illness, and the results of a survey which indicated that more than 6 times as many hepatitis patients had eaten raw clams as had patients without hepatitis. Harvesting waters could not be identified.

4947 **INFECTIOUS HEPATITIS.** *(Sp.)* Ferrari, I. (Dept. Infect. Dis., Natl. U. Cordoba, Argentina), J. M. Gomez Ochoa and H. R. A. Cabral. *Rev Fac Cien Med Cordoba* 26(3-4):331-335, 1968.

One hundred fifty nine clinical histories of patients with infectious hepatitis obtained between 1950-1966 were studied. The majority of the patients were between ages 15 and 45 yr; men comprised 58% of the cases. Of the 159 patients, 84% were from urban communities. The most frequent symptoms were: anorexia, vomiting, nausea, abdominal pain, asthenia, headache, chills, and pruritis. In 66% of the cases the liver was enlarged. The Hanger test was positive in 53.54% and the thymol turbidity test positive in 67.30%. There was an increased cholesterol level in 50%. Of the 111 patients who had Bilirubin measured, 85.5% had hyperbilirubinemia. The incidence of infectious hepatitis was most frequent between March and the end of July.

4948 **ASPECTS OF VIROLOGY IN HEPATITIS.** *(Por.)* Monteiro, E. F. (Dept. Virol., Oswaldo Cruz Inst., Rio de Janeiro, Brazil). *Folha Med* 56(2):255-270, 1968.

4949 **PURINE NUCLEOSIDE PHOSPHORYLASE ACTIVITY IN SERUM AND IN HEPATIC AND SPLENIC TISSUE IN EXPERIMENTAL INFECTION WITH THE MHV$_3$ VIRUS.** *(It.)* De Ritis, F. (Infect. Dis. Clin., U. Naples, Italy), B. Galanti, A. Mancini and G. Giusti. *Enzymologia* 35(5):283-288, 1968.

4950 **CLINICAL AND IMMUNOLOGICAL CHARACTERISTICS OF BOTKIN'S DISEASE IN CHILDREN.** *(Rus.)* Shilenok, I. G. (Med. Inst., Krasnoyarsk, USSR) and R. A. Belousova. *Pediatriia* 47(11):10-12, 1968.

4951 **ASPECTS OF THE WORKING CAPACITY OF PATIENTS SUFFERING FROM POST-VIRAL CHRONIC HEPATITIS.** *(Fr.)* Georgesco, A. (Inst. Eval. Working Capacity Rehab., Bucharest, Romania), E. Gulan and D. Iliesco. *Fegato* 14(4):543-552, 1968.

4952 **THE ROLE OF PHYSICAL EXERTION IN THE WORSENING OF THE CONDITION OF PATIENTS WITH POSTVIRAL CHRONIC HEPATITIS.** *(Fr.)* Berlogea, O. (Inst. Eval. Working Capacity Rehab., Bucharest, Romania), A. Georgesco, N. Sirjita and T. Georgesco. *Fegato* 14(4):525-532, 1968.

4953 **JUDGING THE SEVERITY OF ANICTERIC AND NECROTIC FORMS OF INFECTIOUS HEPATITIS IN CHILDREN.** *(Rus.)* Bochko, A. V. (Hosp. Child. Dis., Krasnodar, USSR). *Pediatriia* 46(8):76-77, 1967.

4954 **THE EPIDEMIOLOGY OF INFECTIOUS HEPATITIS.** *(Heb.)* Alkan, W. J., and J. Eshchar. *Harefuah* 86(10):468-469, 1969.

4955 **IMMUNE SERUM GLOBULIN FOR PREVENTION OF VIRAL HEPATITIS.** *(E.)* Anonymous. *Delaware Med J* 41(5):163-165, 1969.

4956 **INFECTIOUS HEPATITIS IN PREGNANCY.** *(E.)* Parker, M. L. (Queen Victoria Mem. Hosp., Melbourne, Australia). *Med J Aust* 2(16):967-971, 1967.

4957 **INFECTIVE HEPATITIS AND PREGNANCY: ANALYSIS OF LIVER FUNCTION TEST RESULTS.** *(E.)* Bennett, N. M. (Fairfield Hosp., Melbourne, Australia), J. A. Forbes, C. R. Lucas and A. Kucers. *Med J Aust* 2(16):974-976, 1967.

4958 **ICTERUS AND ABDOMINAL PAIN IN AN ELDERLY WOMAN. [CASE REPORT]** *(E.)* Mann, R. (Norfolk Gen. Hosp., Va.). *Virginia Med Monthly* 96(7):405-409, 1969.

4959 **ACTIVE CHRONIC HEPATITIS IN INFANCY: POSSIBLE PRESENCE OF THE DISEASE IN SIBLINGS.** *(E.)* Benjamins, D. (Stanford U. Med. Ctr., Calif.) and P. Sunshine. *J Pediat* 75(2):294-298, 1969.

See also: 4273,4303,4557,4879,4906,4910

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4960 ALCOHOLISM AND IRON METABOLISM. *(It.)* Scamperle, R. (Istituti Ospitalieri, Verona, Italy) and A. Galvani. *Fracastoro* 60(4):674-678, 1967.

In 143 alcoholics (with or without alcoholic cirrhosis of the liver and hospitalized for various causes) the behavior of serum iron was studied, by hepatic needle biopsy (78 cases), and by examination of bilirubinemia, proteinemia, protein electrophoresis, BSP, cholesteremia, galactosuria test, prothrombin time, SGOT and SGPT (in all the patients). Ten (12.8%) of the 78 biopsies showed deposits of ferrous pigment in the hepatic tissue. Sideremia was increased in all to between 0.166-0.295 mg%, with the higher values in the inveterate drinkers. In the other 65 patients, not evaluated by biopsy, the values of sideremia ranged between 0.166-0.218 mg% in 9 cases (13.9%) all heavy drinkers. No significant correlation was found between blood-iron values and hepatic damage. There was a tendency to high values of blood iron and the deposition of iron in the hepatic tissue but the correlation was not constant.

4961 SERUM GLUCOSE, INSULIN, AND GROWTH HORMONE IN CHRONIC HEPATIC CIRRHOSIS. *(E.)* Samaan, N. A. (M. D. Anderson Hosp., Houston, Texas), D. B. Stone and R. D. Eckhardt. *Arch Intern Med (Chicago)* 124(2):149-152, 1969.

Plasma glucose, radioimmunoassayable insulin, and growth hormone (HGH) concentrations were measured during oral glucose tolerance tests, (GTT) in 22 patients with chronic hepatic cirrhosis and in 15 normal subjects. Of the cirrhotics, 50% had normal results and 50% showed impaired glucose tolerance. Cirrhotic patients with normal results showed hyperinsulinism. Abnormal results for GTT were associated with hypoinsulinism compared with normal subjects. Fasting levels of HGH were higher than in normal subjects. During GTT, HGH levels in 18 cirrhotics were either not suppressed or showed a paradoxical rise but normal subjects had complete suppression. Patients with hepatic cirrhosis and abnormal GTT results had higher HGH levels at 60, 90, and 120 min compared with patients with normal GTT results. High HGH levels may be responsible for the higher incidence of abnormal glucose tolerance in hepatic cirrhosis and hyperinsulinism preceding hypoinsulinism.

4962 CARDIAC OUTPUT IN PORTAL HYPERTENSION AND LIVER CIRRHOSIS. *(Ger.)* Schriefers, K. H. (Surg. U. Clin., Bonn, Germany). *Bull Soc Int Chir* 27(3):208-213, 1968.

Hemodynamic studies were performed on 43 patients (age 23-63 yr) with liver cirrhosis. In almost half the patients with liver cirrhosis and portal hypertension cardiac output was elevated, which may be due to a reduction in peripheral vascular resistance. In liver cirrhosis patients without portal hypertension such cardiac output changes were absent. In 13 patients with a portacaval anastomosis elevated cardiac output and index generally persisted, but in some it was decreased. The combination of liver cell damage and collateral portal circulation initiates an increase in circulatory activity but the causal pathogen is probably a vascular stimulating substance produced by liver damage.

4963 HAEMODYNAMICS IN LIVER CIRRHOSES. *(Rus.)* Bondar, Z. A. (Sechenov Med. Inst., Moscow, USSR) and V. G. Ivkov. *Ter Arkh* 40(1):73-82, 1968.

Total hemodynamics were studied in 42 patients (age 16-19; 13 women and 29 men), 30 of whom had cirrhosis of the liver, 6 chronic hepatitis, 5 fatty liver dystrophy, and 1 liver amyloidosis. Clinical symptoms of cardiovascular disorders in chronic liver diseases included: shortness of breath after moderate exercise, tachycardia, chest pains, edema, increased heart size, and pathological stethoscopic findings. Hemodynamics were studied chromatographically, with determinations of T-1824 dye in the capillary blood. Hemodynamic findings in fatty liver, chronic hepatitis and biliary cirrhosis were not diagnostic. In portal, postnecrotic and mixed cirrhosis of the liver average cardiac output was higher than normal. In chronic diffuse liver disorders cardiac output was increased. To clarify certain hemodynamic changes data were compared to radioisotope liver studies (with use of ^{131}I-Rose Bengal. With decreased liver circulation, and deterioration of liver function, there was decrease in the general peripheral resistance, dilation of vascular channels and increased blood circulation.

4964 CANNULATION OF THE THORACIC DUCT IN THE PORTAL HYPERTENSION OF LIVER CIRRHOSIS. *(Ger.)* Fritsch, A. (1st Surg. U. Clin., Vienna, Austria) and K. Mach. *Langenbeck Arch Klin Chir* 321(2): 126-139, 1968.

The venous-lymphatic angle was exposed in 24 patients. A normal liver was present in 4 patients and 20 patients had liver cirrhosis (18 of whom had an increase in lymph flow, but only half of these had an enlarged thoracic duct). No association was found between the diameter of the thoracic duct and the amount of lymph flow. Thoracic duct pressure was generally 10-15 cm of H_2O below portal vein pressure (in 1 case the pressures were equal). In 7 of 20 cases an increase of erythrocytes was present in the lymph, hematocrit values being 2-18%. No association was found between hematocrit values and lymph pressure. The thoracic duct cannulation with external lymph drainage was performed without success in 2 patients with bleeding esophagus varices and with mixed success in 6 patients with massive ascites. Thoracic duct cannulation is not recommended in ascites because of complications and short term relief. Cervical venous-lymphatic anastomosis eliminates the complications of external lymph drainage but the therapeutic response has not been clearly evaluated.

4965 GASTRO-ESOPHAGEAL HEMORRHAGE AFTER SPLENECTOMY AND ITS SURGICAL TREATMENT. *(Rus.)* Uglov, F. G. (I. P. Pavlov 1st Leningrad Med. Inst., USSR) and N. U. Usmanov. *Vestn Khir Grekov* 99(10): 14-20, 1967.

Post-splenectomy bleeding from esophageal varices because of portal hypertension was studied in 23 patients (aged 8-30), 15 of whom were treated surgically. Transthoracic suturing of esophageal and gastric veins was done in 5 patients. In 3 cases there was improvement without signs of hemorrhage recurring for 2 yr. Because of esophageal suture insufficiency 2 patients developed purulent mediastinitis and peritonitis which resulted in death. Ligation of the left gastric artery and construction of an organ anastomosis were carried out in 5 patients since vascular anastomosis was not feasible (2 patients had a splenic vein obstruction, 3 had thrombosis of the portal vein). One patient died of hepatic insufficiency while the rest were discharged with little improvement. A venous anastomosis was used in 5 patients (1 mesenterocaval, 4 cavamesenteric). There were good results in 3 patients. Two patients died after cavamesenteric anastomosis 2 days after surgery from recurrent hemorrhage.

4966 REMARKS ON SCINTOGRAPHIC SEMEIOLOGY IN CIRRHOSIS OF THE LIVER. *(It.)* Tesauro, P. (Inst. Gen. Clin. Med. Ther., U. Naples, Italy), G. C. Corsini, M. De Gaetano and C. Tritto. *Rass Int Clin Ter* 48(22):1391-1411, 1968.

4967 PORTAL CIRRHOSIS: SURGICAL THERAPY OF ASCITES WITH LYMPHO-VENOUS ANASTOMOSIS. *(Fr.)* Waserstein, M. (Clin. Hosp., Montevideo, Uruguay), L. Peri, H. Rey and E. Curuchet. *Rev Int Hepat* 18(6):823-832, 1968.

4968 ALCOHOLIC CIRRHOSIS AND LAUNOIS-BENSAUDE DISEASE: HISTORICAL, CLINICAL AND PATHOGENETIC STUDY OF DIFFUSE SYMMETRICAL LIPOMATOSIS WITH PREDOMINANTLY CERVICAL INVOLVEMENT. *(Fr.)* Deparis, M. (Bicetre Hosp., Paris, France), A. Sarrazin, P. Auzépy, M. Robineau and M. F. Forti. *Rev Int Hepat* 18(6):799-821, 1968.

4969 TERMINAL DISTRIBUTION OF THE HEPATIC ARTERY IN NORMAL AND CIRRHOTIC LIVERS. *(Fr.)* Mitra, S. K. *Actualites Hepatogastroent Hotel Dieu* 4(5):B187-B195, 1968.

4970 MESENTERIC-CAVAL ANASTOMOSIS AS AN ALTERNATIVE IN THE SURGICAL TREATMENT OF PORTAL HYPERTENSION: FOLLOW-UP RESULTS IN TWO CASES. *(Por.)* Goffi, F. S. (Med. Fac., U. São Paulo, Brazil), E. Ferrarini, L. C. Silva, A. F. Juliao and E. S. Bastos. *Rev Ass Med Brasil* 13(9):313-319, 1967.

4971 THE EFFECT OF ANGIOTENSIN ON THE KIDNEY IN CIRRHOSIS. *(Fr.)* Kuntzmann, F. (Fac. Med., U. Strasbourg, France), P. Reville, T. Kurtz, C. Vassaux, H. Jahn and J. Stahl. *Path Biol* 15(23/24):1133-1144, 1967.

4972 THE DEVELOPMENT OF SURGERY FOR CIRRHOSIS OF THE LIVER AND PORTAL HYPERTENSION IN THE USSR. *(Rus.)* Napalkov, P. N., I. I. Shafer, S. A. Apakova, A. N. Ardamatskaia, E. A. Shakhanova, V. I. Vitlin and Z. F. Denisenko. *Vestn Khir Grekov* 99(12):3-12, 1967.

4973 CHYLOUS ASCITES IN A CIRRHOTIC PATIENT. [CASE REPORT] *(Fr.)* Caroli, J. (Hôpital Saint-Antoine, Paris, France) and M. Ouahnich. *Rev Medicochir Mal Foie* 44(2):99-108, 1969.

4974 A TRUE SPLENO-RENAL ANASTOMOSIS IN THE COURSE OF PRIMARY CIRRHOSIS AND PORTAL HYPERTENSION. *(It.)* Gadrat, J. (Toulouse, France), A. Ribet, P. Suduca and J.-P. Pascal. *Arch Mal Appar Dig* 58(4-5):257-262, 1969.

4975 THE EFFECT ON DIURESIS OF AUTOGENOUS ASCITIC TREATMENT AND TREATMENT WITH DIURETICS ALONE OR IN COMBINATION IN CIRRHOTIC PATIENTS. *(It.)* Lo Presti, A. (San Giovanni Battista Gen. Hosp., Turin, Italy), F. Pugliese and F. Palmas. *Arch Ital Mal Appar Dig* 35(5):431-444, 1969.

4976 AN AUTOPSY CASE OF JUVENILE HEPATOMA WITH LIVER CIRRHOSIS DUE TO SCHISTOSOMIASIS JAPONICA. *(Jap.)* Kure, S., T. Matsuda, S. Matsuda and S. Nagahara. *Jap J Cancer Clin* 13(9):705-709, 1967.

4977 PLASMA TRIGLYCERIDE PATTERNS IN CERTAIN DISEASE ENTITIES. *(Pol.)* Wojnar, S. (2nd Clin. Intern. Dis., Warsaw, Poland), W. B. Szostak, E. Ruzyllo and B. Milewski. *Pol Tyg Lek* 22(45):1727-1729, 1967.

4978 PATHOGENESIS OF ASCITES IN CIRRHOSIS OF LIVER. PART I. *(Rev.)(E.)* Liebowitz, H. R. (New York U.-Bellevue Med. Ctr., N. Y.). *New York J Med* 69(13):1895-1913, 1969.

4979 PATHOGENESIS OF ASCITES IN CIRRHOSIS OF THE LIVER. PART II. *(Rev.)(E.)* Liebowitz, H. R. (New York U.-Bellevue Med. Ctr., N. Y.). *New York J Med* 69(14):2012-2024, 1969.

4980 THE KIDNEY IN LIVER CIRRHOSIS. *(Sp.)* Gini, R. (Hosp. Natl. Clin., Buenos Aires, Argentina), J. Testini, A. Campos and Garcia Dadoni, L. R. A. *Prensa Med Argent* 56(3):118-123, 1969.

See also: 4280,4311,4319,4429,4502,4545,4552,4607,4877,4923

Gallbladder and Biliary Tract Diseases

4981 **SERUM IMMUNOGLOBULIN LEVELS IN CHOLESTASIS.** *(E.)* Bevan, G. (Mayo Clinic & Mayo Found., Rochester, Minn.), W. P. Baldus and G. J. Gleich. *Gastroenterology* 56(6):1040-1046, 1969.

Serum immunoglobulin (Ig) concentrations were measured in 49 patients with clinical features of obstructive jaundice. In 32 patients jaundice was due to surgically proved extrahepatic biliary obstruction. Of 17 patients with intrahepatic cholestasis, 13 had primary biliary cirrhosis and 4 had chlorpromazine jaundice. Serum IgM concentrations were elevated in all except 2 of the patients with primary biliary cirrhosis, but were not elevated in the patients with chlorpromazine-induced cholestasis or those with extrahepatic biliary obstruction. This observation, and the finding of raised IgM values in cases of certain other parenchymal liver diseases, suggest that caution should be exercised in advising surgery for jaundiced patients with elevated serum concentrations of IgM.

4982 **IDENTIFICATION OF THE PROTEIN MOIETY OF AN ABNORMAL HUMAN PLASMA LOW-DENSITY LIPOPROTEIN IN OBSTRUCTIVE JAUNDICE.** *(E.)* Alaupovic, P. (U. Oklahoma Sch. Med., Oklahoma City), D. Seidel, W. J. McConathy and R. H. Furman. *FEBS Letters* 4(2):113-116, 1969.

An abnormal low-density lipoprotein (LP-X) was isolated from the blood of 4 fasting patients with extra-hepatic biliary obstruction. Apolipoprotein C (ApoC) was isolated from the 5 hr postprandial blood of hypertriglyceredemic (types 3 and 5) patients and the chyle of 1 normal fasting patient. LP-X, characterized by a high phospholipid/protein ratio of 11.5 and single bands in agar and agarose electrophoresis, gave no reaction with antibodies to normal serum, albumin, LP-A (lipoproteins characterized by the presence of apolipoprotein A, ApoA), or LP-B (lipoproteins characterized by the presence of lipoprotein B, ApoB); it reacted only with antibodies to LP-X. Partially delipidized LP-X also gave a positive reaction with antibodies to albumin. The positive immunoprecipitin reaction of delipidized nonalbumin protein from LP-X with antibodies to very low density lipoprotein (VLDL) but not with antibodies to LP-A or LP-B, indicated a similarity to ApoC. The mobility of partially and totally delipidized ApoC in agar and agarose electrophoresis was the same as that of the nonalbumin protein. Partially delipidized ApoC gave no reaction with antibodies to human LP-A, LP-B, whole serum and albumin or with antibodies to rabbit whole serum or γ-globulin, but showed a total coalescence of precipitin lines with antibodies to VLDL and LP-X. Its C-terminal amino acid and C-terminal sequence was the same as that of the nonalbumin protein of LP-X. A direct comparison of partially delipidized nonalbumin protein and ApoC showed that these 2 proteins gave complete fusion of precipitin lines with antibodies to VLDL and LP-X.

4983 **HEPATIC ECHINOCOCCOSIS AND CHOLELITHIASIS.** *(Fr.)* Kourias, B. (Red Cross Hosp., Athens, Greece) and P. Peveretos. *Lyon Chir* 65(3):222-231, 1969.

An association between hepatic echinococcosis and cholelithiasis was found 85 times, between 1950-1967, in 484 patients with hepatic cyst, and 3573 patients with biliary lithiasis. The cyst was calcified in 36%, multilocular in 34%, infected or suppurated in 25%, and ruptured into the biliary ducts in 26%. Jaundice was found in 37.6%, cholangitis in 31.8%. In 88.9% of the cases a single operation was performed to eliminate both conditions; in 11% the operation was performed in 2 stages because of the severe condition of the patients. The operations on the cysts were: drainage in 51%, total cystotomy in 15.5%, partial cystotomy in 17.2%, and primary suture in 15.5%. The operations on the biliary ducts were: cholecystectomy in 48 (54%), cholecystotomy in 2 (2.2%), choledochotomy and associated cholecystectomy in 39 (43.8%). The importance of cholangiography performed during the operation, of cholangioscopy, and the instrumental dilatation of Oddi's sphincter were stressed. Overall mortality was 10.6%. The follow-up results were: excellent in 84.4%; good or fair in 10.2%; recurrence or failure in 5%.

4984 **PATHOLOGY OF THE TERMINAL CHOLEDOCHUS.** *(Sp.)* Puente, S. ("D" Surg. Sect., U. Chile, Santiago), M. Santos and A. Aguirre. *GEN* 22(4): 287-294, 1968.

A study of 112 cases of terminal choledochus disease (defined as that part of the biliary tract which includes the retroduodenal, the retro- and intrapancreatic, and the intraparietal segments) showed that 105 were benign and 7 malignant. The benign cases were: 57 odditis, 26 calculi, 16 stenosis by pancreatopathy, 5 surgical stenosis, and 1 papillary polyp. Of the 57 cases of odditis, 41 were associated with pancreatopathies–particularly biliary lithiasis. Odditis was diagnosed radiologically in 17 patients, histologically in 14, by a combination of the 2 methods in 17, and by instrumental exploration in 9. All the odditis cases were treated surgically with a transduodenal sphincterotomy. Postoperative morbidity was 13 of 57 patients, and mortality 3 of 57. Follow-up studies ranging from 6 months to 5 yr showed 41 good results, 3 average, 2 poor, and 8 lost.

4985 **OPERATIVE CHOLANGIOGRAPHY USING A NEW TECHNIQUE.** *(E.)* Hecker, E. T. (Zieger Osteopathic Hosp., Detroit, Mich.). *J Amer Osteopath Ass* 68(2):131-136, 1968.

A polyethylene catheter is inserted into the cystic duct and clamped with a modified Mixter clamp (the tip has a 1/16th inch diameter hole and the handle is bent in a 45° angle). Fixing the tubing within the duct is simplified by eliminating ligatures in a limited space and by the short distance of passage required to clamp the catheter. A mobile Polaroid X-ray unit is used for the first exposure to ascertain position and the accurate placement of the catheter by injection. The second and third films are routine X-rays for comparison, detail, and analysis. Seventy-six patients were studied. All had oral Telepaque tablets. If the gallbladder could not be visualized with 6 tablets, repeat X-rays were taken with a double dose. Then, if the gallbladder still was not visualized, i.v. injection was necessary. There were 36 such instances in the series. Cystic duct cannulation was used in 51 and T-tube cholangiography in 25. Time is reduced and the need for multiple X-ray films eliminated with this method.

4986 DIAGNOSTIC AND THERAPEUTIC ASPECTS OF STONES IN THE HEPATIC DUCT. *(It.)* Sturlese, P. (Ospedale Civil, La Spezia, Italy) and G. Sclausero. *Rass Arch Chir* 5(5, Suppl. 1):28-64, 1967.

A study on 192 cases of lithiasis of the biliary ducts revealed that cholecystectomy was performed in 22 patients; cystic-choledochotomy in 17; supraduodenal choledochotomy in 57, transduodenal sphincterotomy in 78 and papillotomy in 19. Intraoperative radiology was found useful. In 142 patients external biliary drainage (Dogliotti) was used, in 5 Kahr's technique and in 3 Cattel's procedure. Postoperative direct cholangiography, evaluated the functional activity of the ducts. After operation, 20 patients died: 50% of them were more than 60 yr old.

4987 PLASMA CONCENTRATION OF 17-HYDROXYCORTICOSTEROIDS IN CHOLECYSTITIS. *(Rus.)* Karaman, N. V. (Pirogov Med. Inst., Odessa, USSR). *Klin Khir (Kiev)* (12):14-17, 1968.

4988 A TECHNIQUE FOR CHOLECYSTOJEJUNOSTOMY. *(Rus.)* Linchenko, I. F. (Med. Inst., Stavropol, USSR). *Klin Khir (Kiev)* (12):10-14, 1968.

4989 ACUTE CHOLECYSTITIS IN INFANCY. *(Por.)* Freire, E. C. S. *Brasil Med* 82(3):199-204, 1968.

4990 RADICAL SURGICAL TREATMENT OF CANCER OF THE EXTRAHEPATIC BILE DUCTS. *(Rus.)* Seleznev, G. I. (Omsk Med. Inst., USSR). *Vop Onkol* 14(12):99-100, 1968.

4991 A RARE ANOMALY OF THE EXTRAHEPATIC BILE DUCTS. *(Pol.)* Doliński, J. (1st Surg. Clin., Acad. Med., Wroclaw, Poland) and E. Walkiewicz. *Wiad Lek* 21(21):1977-1979, 1968.

4992 SURGICAL TREATMENT OF CONGENITAL OBSTRUCTION OF THE BILE DUCTS. *(Pol.)* Kaliciński, Z. *Wiad Lek* 21(22):2079-2080, 1968.

4993 ILEUS AND LETHAL HEMORRHAGE FROM A CHOLECYSTODUODENAL FISTULA AS A COMPLICATION OF CHOLELITHIASIS. *(Pol.)* Górtowska, I. (Jordan Hosp., Lódź, Poland) and T. Modrzewski. *Wiad Lek* 21(21):1973-1975, 1968.

4994 CANCER OF THE GALLBLADDER REVEALED BY MELENA. *(Fr.)* Dieulafe, R. *Arch Franc Mal Appar Dig* 58(3):171-176, 1968.

4995 CHOLESTEROLOSIS AND MUCOSAL HYPERPLASIA OF GALLBLADDER. *(E.)* Elfving, G. (Dept. Pathol. U. Helsinki, Finland), A. Palmu and H. Teir. *Ann Chir Gynaec Fenn* 57(1):28-30, 1968.

4996 CHOLEDOCHODUODENOSTOMY AND PAPILLARY HEPATICOGASTROSTOMY. *(Por.)* Mammana, C. Z. (Med. Sci. Fac., Santa Casa, São Paulo, Brazil). *Folia Med* 57(6):857-867, 1968.

4997 DOES ACUTE OBSTRUCTION OF THE COMMON BILE DUCT PRODUCE DISTENSION OF THE RAT BILE TREE? *(E.)* Barber-Riley, G. (Inst. Med. Sci., Haile Selassie I U., Addis Ababa, Ethiopia), K. Y. Chan and M. Tong. *Experientia* 23(11):926-927, 1967.

4998 CHOLELITHIASIS IN CHILDHOOD. [REPORT OF 3 CASES.] *(It.)* Martinelli, G. L. (Hosp. Inst., Modena, Italy) and R. Bergamaschi. *Minerva Pediat* 19(27):1742-1746, 1967.

4999 THE IMPORTANCE OF THIAMINE AND RIBOFLAVIN IN THE COMPLEX THERAPY OF CHOLECYSTITIS IN CHILDREN. *(Rus.)* Chernova, O. F. (Kazan Inst. Postgrad. Med., USSR). *Pediatriia* 46(8):79, 1967.

5000 SECRETORY FUNCTION OF THE PANCREAS IN CHILDREN SUFFERING FROM BILIARY TRACT DISEASES. *(Rus.)* Ondar, D. K. (N. I. Pirogov Med. Inst., Moscow, USSR). *Pediatriia* 46(9):56-58, 1967.

5001 EARLY RESULTS OF THE SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS. *(Pol.)* Dowgird, A. (J. Sniadecki Provincial Hosp., Bialystok, Poland), S. Sierko, T. Jankowski and E. Biernacki. *Pol Przegl Chir* 39(9):895-901, 1967.

5002 SURGICAL TREATMENT OF CHOLECYSTITIS AND COMPLICATIONS CONNECTED WITH OPERATIONS ON THE BILIARY TRACT. *(Rus.)* Smirnov, Ie. V. (S. M. Kirov Acad. Milit. Med., Leningrad, USSR). *Vestn Khir Grekov* 99(8):28-34, 1967.

5003 CARCINOMA OF THE EXTRAHEPATIC BILE DUCTS WITHOUT METASTASES. REPORTS OF 4 CASES. *(Jap.)* Naito, T. (Tachikawa Hosp., Japan), K. Horie and Y. Matsushima. *Med J Mutual Aid Ass* 18(1):67-77, 1969.

5004 A CASE OF SCHISTOSOMIASIS JAPONICA WITH AMPULLARY CARCINOMA OF VATER. *(Jap.)* Teramoto, T. (Meijo Hosp., Nagoya, Japan), Y. Nakae, J. Takahashi, H. Banno, M. Ishiguro, E. Sasano and K. Oshima. *Med J Mutual Aid Ass* 18(1):78-83, 1969.

5005 AN ILLUSTRATION OF A CASE OF IDIOPATHIC SEGMENTARY DILATATION OF THE COMMON BILE DUCT IN THE ONE MONTH OLD BREAST-FED CHILD. *(It.)* Giugiaro, A. (Regina Margherita Child. Hosp., Turin, Italy) and E. Grassi. *Minerva Pediat* 21(28): 1299-1306, 1969.

5006 SPONTANEOUS EXTERNAL BILIARY FISTULA AND VESICULAR PHLEGMON. TWO CASES. *(Fr.)* Mouchet, A. (Henry-Dunant Hosp., Paris, France), J. Vilotte, C. D'Allaines, A. Belkaid and R. Buchet. *Arch Mal Appar Dig* 58(4-5):249-256, 1969.

5007 NEONATAL CHOLESTATIC ICTERUS. CLINICO-DIAGNOSTIC CONSIDERATIONS. *(It.)* Ferrari, G. (Pediat. Clin., U. Turin, Italy) and V. Perfetto. *Minerva Pediat* 21(9):355-370, 1969.

5008 PRIMARY SCLEROSING CHOLANGITIS. A REPORT OF TWO CASES. *(E.)* Koven, I. H. (New Mount Sinai Hosp., Toronto, Canada), A. Golab, D. R. Bohnen and H. A. Himel. *Canad Med Ass J* 101(2):103-108, 1969.

5009 PRECORDIAL PAIN COMPLICATING BILIARY TRACT LITHIASIS. *(It.)* Pezzana, A. (S. Spirito Hosp., Casale Monferrato, Italy) and N. Maltoni. *Minerva Med* 60(29):1376-1386, 1969.

5010 CLINICAL STUDY OF PRIMARY CANCER OF THE EXTRAHEPATIC BILIARY TRACT. 101 CASES. *(E.)* Chang, K. R. (Dept. Surg., Catholic Med. Coll., Korea), D. H. Yang and Y. H. Park. *J Korean Cancer Res Ass* 2(2):75-90, 1967.

5011 PREGNANCY IS CHOLESTATIC. *(E.)* Simcock, M. J. (Royal Women's Hosp., Melbourne, Australia) and F. M. C. Forster. *Med J Aust* 2(16):971-973, 1967.

5012 LATE RESULTS OF CHOLEDOCHO-DUODENAL ANASTOMOSIS. *(Rus.)* Soloveva-Raskina, I. I., N. T. Medvedeva, V. Ie. Bagdatev and I. I. Parusova. *Vestn Khir Grekov* 99(11):81-84, 1967.

5013 MEGACHOLEDOCHUS CAUSED BY DYSTROPHY OF THE SPHINCTER OF ODDI AND VATER PAPILLA LIMITS ITS EXTREME DIMENSIONS AND POSSIBILITIES FOR SURGICAL CHANGING. *(Fr.)* Corneleac, E. (Botosani, Romania). *Rev Intern Hepat* 17(7):669-674, 1967.

5014 THE ROLE OF BIRTH INJURY IN NEONATAL JAUNDICE AND HYPERBILIRUBINAEMIA. *(E.)* Várdi, P. (U. Med. Sch., Budapest, Hungary) and I. Zoltán. *Acta Chir Acad Sci Hung* 8(3):215-222, 1967.

5015 THE RADIOLOGICAL METHOD FOR MEASURING PRESSURE AND FLOW DURING SURGERY OF THE EXTRAHEPATIC BILIARY TRACT. *(Fr.)* Vayre, P. (Vaugirard Hosp., Paris, France), J. Hureau and M. Roux. *Arch Mal Appar Dig* 58(4-5):263-264, 1967.

5016 THE SYNDROME OF INCOMPLETE BILIARY OBSTRUCTION. *(Cz.)* Keclík, M. (Fac. Gen. Med., Charles U., Prague, Czechoslovakia), A. Huslarová and Z. Sivanová. *Cas Lek Cesk* 106(40):1049-1054, 1967.

5017 MARKED ELEVATIONS OF SERUM GLUTAMIC OXALACETIC TRANSAMINASE AND LACTIC DEHYDROGENASE ACTIVITY IN CHRONIC EXTRAHEPATIC BILIARY DISEASE. *(E.)* Abbruzzese, A. (Harvard Med. Sch., Boston, Mass.) and R. L. Jeffery. *Amer J Dig Dis* 14(5): 332-338, 1969.

5018 RUPTURE OF GALL-BLADDER ASSOCIATED WITH INTRAPERITONEAL RUPTURE OF URINARY BLADDER. [CASE REPORT]. *(E.)* Blumgart, L. H. (Nottingham Gen. Hosp., England). *Brit J Surg* 56(1): 76-77, 1969.

5019 PARTIAL SECRETION OF THE ACID COMPONENT OF GASTRIC JUICE AND INDICES OF ELECTROGASTROGRAPHY IN CASES WITH CHRONIC INFLAMMATION OF THE BILIARY DUCTS DURING EXACERBATION. *(Rus.)* Geller, L. I. (Khabarovsk Med. Inst., USSR), R. G. Maschenko and E. A. Svetacheva. *Ter Arkh* 39(12):83-86, 1967.

5020 INTESTINAL OBSTRUCTION AND CHOLECYSTO-ENTERIC FISTULA AS COMPLICATIONS OF BILIARY LITHIASIS. *(Heb.)* Barzilai, A. (Haifa, Israel) and G. M. Weisz. *Harefuah* 86(10):443-447, 1969.

See also: 4276,4281,4318,4319,4322,4416,4422,4552,4573,4589,4592,4623,4688,4836,4837,4939

5021 COMPARISON OF ORALLY ABSORBABLE AND NONABSORBABLE ANTIBIOTICS IN SHIGELLOSIS. A DOUBLE-BLIND STUDY WITH AMPICILLIN AND NEOMYCIN. *(E.)* Haltalin, K. C. (U. Texas Southwestern Med. Sch., Dallas), J. D. Nelson, L. V. Hinton, H. T. Kusmiesz and M. Sladoje. *J Pediat* 72(5):708-720, 1968.

Thirty infants and children (18 males, 12 females) with shigellosis were treated. Signs and symptoms included blood in stools (11), mild vomiting (13), marked vomiting (1), fever (24), convulsions (11), "toxic" (11), and abdominal pain (13). Fifteen patients were treated with neomycin and 15 with ampicillin. Shigellae serotypes were isolated from each patient: 5 had *S. sonnei* and 25 had *S. flexneri* (6 different serotypes of *S. flexneri* were found.) In the neomycin-treated group 13 patients of 15 had Shigellae in their stools 48 hr after therapy, but only 2 of 15 patients in the ampicillin-treated group showed such results. The mean number of days until the stools were negative for Shigellae in the neomycin- and ampicillin-treated groups was 5.4 (range 2.5-8) and 2.2 (range 0.5-4.5), resp. Candida species were isolated from 31% (20 of 65) of the stool specimens from neomycin-treated patients and from 60% (43 of 70) of the specimens from ampicillin-treated patients. Clinical failure (defined as persistence of diarrhea more than 5 days after study drugs started or removal of the patient from the course because of deteriorating condition or both) occurred in 60% (9 of 15) of neomycin-treated patients and in 13% (2 of 15) of the ampicillin-treated patients. The mean number of days until patients became afebrile was 2.3 in the neomycin group and 1.5 days in the ampicillin group. SGOT values were determined before and after drug therapy in 15 neomycin-treated patients and in 13 ampicillin-treated patients. Mean SGOT values before and after therapy were 43 and 37 Karmen U in the neomycin group and 33 and 47 Karmen U in the ampicillin-treated group.

5022 PRIMARY LYMPHOMA OF THE GASTROINTESTINAL TRACT. A REVIEW OF 100 CASES. *(E.)* Loehr, W. J. (Cornell Med. Ctr., Ithica, N. Y.), Z. Mujahed, F. O. Zahn, G. F. Gray and B. Thorbjarnarson. *Ann Surg* 170(2):232-238, 1969.

One hundred cases (52 male, 48 female) of primary lymphoma of the gastrointestinal tract are reviewed. The sites involved included stomach (63 patients, average age 56 yr), small intestine (25 patients, average age 42 yr), appendix (2 cases), and large intestine (10 patients, average age 54 yr). The overall 5 yr survival rate was 49%. The highest survival rate (85%) was in patients who had definitive resections of the lesion followed by 3000 to 4000 r X-ray. Of 6 patients treated by X-ray alone in tumoricidal doses only 1 survived more than 5 yr. Prognosis was not related to the microscopic pattern of the lymphoma or to the site. Recurrence invariably produced symptoms within 2 yr after therapy. Average survival time for patients not "cured" was 6 months. Of the 100 patients 24 survived for 10 to 30 yr and none developed recurrences. The prognosis is 5 yr or more after therapy in an asymptomatic patient.

5023 LYMPHOMA OF THE GASTROINTESTINAL TRACT: PROGNOSTIC GUIDES BASED ON 162 CASES. *(E.)* Naqvi, M. S. (Mt. Sinai Sch. Med., New York, N. Y.), L. Burrows and A. E. Kark. *Ann Surg* 170(2): 221-231, 1969.

One hundred and sixty-two cases (89 male, 73 female) of gastrointestinal lymphomas treated and followed over a 30 yr period are reported. Stomach locations accounted for 100 lesions (55 male, 45 female), or 61% of the total. Most patients were in their sixth decade and the most common symptoms were weight loss and epigastric pain. Gastrointestinal X-rays were normal in only 3 patients but malignancy was diagnosed preoperatively in only 55 patients with all diagnostic techniques. The operative mortality was 18% and 29% (29 cases) survived 5 or more yr. Subtotal gastric resection (58), esophagogastrectomy (11), laparotomy and biopsy (10) and total gastric resection were the most common surgical approaches. There were 48 (27 male, 21 female) lymphomas of the small intestine (27.5% of the total). The largest number occurred during the sixth decade. Weight loss, anemia and crampy lower abdominal pain with nausea and vomiting were the presenting symptoms. Thirty-seven of the 45 patients treated underwent surgery (segmental small bowel resections in 27) while 8 were treated with radiotherapy and/or chemotherapy. There were 6 deaths in the operative period (18% mortality). The 5 yr survival after surgery was 31% (15 patients). After conservative therapy only 1 of 8 survived. There were 14 (7 male, 7 female) large intestine lymphomas. The greatest number of patients were between 50 and 70 and the usual symptom was crampy, lower abdominal pain. Bleeding per rectum was the chief complaint in lesions of the rectum and rectosigmoid. Six patients had definitive colectomies. Others with rectum and rectosigmoid lesions were biopsied and radio- or chemotherapy administered. Five patients survived 5 or more yr. Staging of the extent of involvement and within each stage and histologic typing were valuable prognostic aids.

5024 DISACCHARIDE INTOLERANCE IN THE AETIOLOGY OF CHRONIC AND/OR RECURRENT DIARRHOEA IN YOUNG CHILDREN. *(E.)* Chandra, R. K. (All-India Inst. Med. Sci., New Delhi), R. R. Pawa and O. P. Ghai. *Indian J Med Res* 57(4):713-717, 1969.

Children (192; all except 5, 4 yr or younger) suffering from chronic and/or recurrent diarrhea were screened for acid stools. Of 63 with a fecal pH below 6, 49 showed evidence of carbohydrate intolerance. The d-xylose test was abnormal in 5 of 18 patients. Steatorrhea was observed in 9 out of 23 children. All patients showed a dramatic response after withdrawal of the offending sugar. In 3 children with a positive family history, a primary enzymic defect is possible. Acquired disaccharide intolerance is a significant factor in the etiology of chronic and/or recurrent diarrhea in young children.

5025 COMBINED APPROACH TO UPPER GASTROINTESTINAL BLEEDING. *(E.)* Mitty, W. F. Jr. (New York U. Sch. Med., N. Y.), D. Befeler, C. E. Grossi, C. A. Bonanno, F. F. Ruzicka and P. Rossi. *Amer J Gastroent* 51(5): 377-386, 1969.

Patients (25) with massive upper gastrointestinal bleeding admitted during 1964 were compared with a similar group of patients (50) investigated in 1967. The definition of a massive bleeder is a patient who requires at least 6 U of blood/day to stabilize his vital signs. The later study revealed that arteriography and endoscopy were the more usual examinations while in the earlier the most common examinations were gastrointestinal series and portography. By using the combined diagnostic approach fewer errors in diagnosis were made. The incidence of patients discharged with the diagnosis of bleeding of unknown etiology was markedly decreased and the incidence of gastritis visualized by endoscopic examination of the stomach was increased. The accuracy of the combined approach in 1967 was 95%, while in the 1964 series it was 81%.

5026 **VOMITING IN THE AGED.** *(Fr.)* Bouchon, J. P. *Maroc Med* 48(514):329-332, 1968.

A study was made of vomiting among the aged patients admitted during a 1-yr period. Of 518 patients, 217 have died; a not surprising ratio since their median age was 82 yr. There were 43 instances of vomiting among 301 living patients, and 33 among 217 that died: a statistically insignificant difference. Of 47 patients with severe diseases of the abdominal cavity, 40 (more than 80%) were vomiting on admission; mortality in this group was more than 50%. Of the 518 patients 8 presented hematemesis (6 of these 8 died; anticoagulant therapy was useful in 1 ulcer patient and 1 unknown cause; and hiatal hernia was absent in all). Hiatal hernia is found frequently in the aged and is the cause of prolonged occult hemorrhage with resultant hypochromatic anemia.

5027 **THE PROGNOSIS IN NEONATAL PERITONITIS BASED ON 32 CASES.** *(Fr.)* Lasserre, J. (Child. Hosp., Bordeaux, France), G. Saintsupery, R. Letac and J. C. Besset. *Ann Chir Infant* 9(1):77-84, 1968.

Neonatal peritonitis is considered to exclude the biliary and meconium forms, is septic, and occurs in the first month of life. Among the 32 cases, 17 were perforations: 6 gastric, 1 duodenal and 10 intestinal. Three of 6 died from gastric, 1 of 1 from duodenal, and 6 of 10 from intestinal peritonitis. Ten patients were without perforation: in 2 the peritonitis was secondary to a volvulus of the small intestine with gangrene (1 of 2 died after surgery); in 4 the peritonitis was primary (3 of 4 died after early surgery and the other was treated surgically after 24-hr antibiotic therapy); 3 of 3 were treated medically and were cured. Of 5 patients with postoperative peritonitis, 3 died. Of 32 patients studied 15 are alive. In the series of 9 patients with neonatal peritonitis studied before 1960, 1 is alive; in the series of 23 patients studied after 1960, 14 are alive.

5028 **INHIBITION OF IMMUNOLOGICAL EXPULSION OF HELMINTHS BY RESERPINE.** *(E.)* Sharp, N. C. C. (Wellcome Lab. Exp. Parasitol., U. Glasgow, Scotland) and W. F. H. Jarrett. *Nature* 218(5147):1161-1162, 1968.

Twenty Lister rats (approximately 200 g in body weight) were injected s.c. in the abdomen with 3000 infective larvae of *Nippostrongylus brasiliensis.* After 11 days, dosing with reserpine began in 1 group of 10 rats. The initial dose was 5 mg/kg, reduced to 2 mg/kg on day 12 because of the severe reaction to the higher dose, and further reduced on days 13, 14, and 15 to 1 mg/kg. The other group of 10 rats received no treatment and served as controls. Fecal egg counts were made daily using one bulked sample from each group on days 11-15. On day 16 all animals were killed and worm counts made on each rat. The egg counts in feces were inconclusive; an adequate sample of feces from the reserpine-treated group could not be obtained on days 11-13 because the rats had diarrhea. High egg counts were found in the reserpinized rats on days 14 and 15. Worm counts ranged from 17 to 650 in the controls and from 349 to 1485 in the treated group. The geometric mean in the controls was 69.7 and in the treated 827.5. The difference between the means is statistically significant.

5029 **RESULTS OF MASSIVE GASTROINTESTINAL BLEEDING THERAPY.** *(Ger.)* Dalichau, H. (Northwest Hosp., Frankfurt/Main, Germany), E. Ungeheuer and G. Schade. *Med Klin* 63(14):587-591, 1968.

During a 4 yr period (1963-1967) 246 patients were treated for massive gastrointestinal bleeding. Sites of bleeding were peptic ulcers (43.9%), esophagus varices (43.5%), various single sites (7.7%) and undetermined sites (4.9%). In the 108 patients with peptic ulcers (25-86 yr of age; 66.7% over 50) the ulcer was located in the duodenum in 60 (55.1%), stomach in 44 (36.6%) and jejunum in 9 (8.2%). Of 94 patients treated surgically because of the severity of bleeding, 43 were operated on within the first 48 hr after admission. Total mortality was 19.1% (88.8% of whom were over 50 yr), while the mortality rate for those operated upon early was 9.5%. In the 107 patients with esophagus varices 94 (87.8%) had a liver disorder (almost 90% had liver cirrhosis with portal hypertension). Of 49 patients treated conservatively 31 died (63.3%), of 20 operated on palliatively 7 died (35.0%) and of 38 treated with a shunt operation 5 died (13.2%). Surgical procedures are, of course, contraindicated in many.

5030 **FINGER NAIL CLUBBING IN KWASHIORKOR.** *(E.)* Amla, I. (Cheluvamba Hosp. & Med. Coll., Mysore, India) and J. V. Narayan. *Indian J Pediat (Calcutta)* 35(240):19-22, 1968.

The study group consisted of 60 children (25 male and 35 female aged 1-4 yr) admitted to the hospital during 1965-1967, and all displaying clinical features characteristic of kwashiorkor: growth retardation, apathy, gross edema, depigmentation and sparseness of hair. Diarrhea was the presenting symptom in 38 patients. Stool culture showed no sign of Shigella infection; bacterial growth was mainly *E. coli;* low grade fever was present in 46; there was evidence of vitamin A deficiency in 43 and of vitamin B complex deficiency in 33. Three grades of clubbing were established: Grade I, thickening of the nail with resultant reduction of the normal angle (about 15°) made by the nail and the dorsal plane of distal phalanx, with a positive profile sign and the presence of fluctuation over the nail. Grade II, increase in antero-posterior as well as transverse curvature of the nail. Grade III, drumstick appearance of the terminal digits. Of the 60 cases studied, 46 (76.7%) showed fingernail clubbing: 26 (43.3%) Grade I, 19 (31.7%) Grade II, and 1 (1.7%) Grade III. Clubbing of the toenails was minimal or absent. The mild to moderate fingernail clubbing may be due to a nonspecific infection of the gut and may be explained by the vagal innervation theory. There was a good correlation between the degree of clubbing and the presence and duration of diarrhea: of the 14 cases without clubbing, diarrhea was absent in 10.

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5031 SURGICAL ASPECTS OF INGESTED FOREIGN BODIES AND SELF-INFLICTED INJURIES. *(Ger.)* Berger, A. (1st Surg. U. Clin., Vienna, Austria), G. Lechner and O. Wagner. *Wien Med Wschr* 118(9/10):203-207, 1968.

In the years 1955-1966 80 prisoners were treated for swallowed foreign bodies and 32 for self-inflicted injuries. Surgery was necessary in 67% and conservative treatment with natural passage of foreign bodies in the rest. There were 14 perforations (17.4%) among the 80 patients: 2 of the esophagus, 4 of the stomach, 4 of the duodenum, 3 of the small intestine, and 1 of of the large intestine. Penetrations occurred in 8 (10%): stomach (3), duodenum (4) and small intestine (1). Total mortality rate was 3.7%. To minimize complications, surgery is indicated, specially if the foreigh body is located in the esophagus and duodenum.

5032 THE UNIQUE ASSOCIATION BETWEEN SALIVARY GLAND CANCER AND BREAST CANCER. *(E.)* Berg, J. W. (Memorial Hosp. Cancer Allied Dis., New York, N. Y.), R. V. P. Hutter and F. W. Foote Jr. *JAMA* 204(9):771-774, 1968.

In 396 patients with cancer of the major salivary glands, who were followed up for over 1600-patient years, 11.2 later-appearing cancers were expected, but 22 occurred. This increase is statistically highly significant. Part of the risk was due to an excess of skin cancer: 7 cases when 3 were expected. Irradiation therapy may have been the cause of the excess skin cancers. For cancers occurring in tissue other than skin, 8.2 were expected and 15 were seen. Almost all the excess was due to breast cancers in women: 1 was expected and 7 were seen. At other sites 7.3 cancers were expected and 8 were seen. The probability that these salivary gland cancer patients had breast cancer only by chance is about 0.004%. In 5 of the 7 patients, the salivary gland cancer was histologically mucoepidermoid or anaplastic epidermoid. If the concept is accepted that the latter epidermoid carcinomas are malignant varieties of the mucoepidermoid type, then women with such tumors were at a 13.5-fold risk for having breast cancer, while women with other types of salivary gland cancer were at only a 4-fold risk.

5033 CONCERNING GASTROINTESTINAL HEMORRHAGES. *(Rus.)* Kozlov, I. Z. (Moscow Med. Inst., USSR) and T. P. Androsova. *Sovet Med* 31(6):54-59, 1968.

Analysis of a series of 701 instances of acute gastrointestinal bleeding showed that 51.2% were due to gastric and duodenal ulcers, 14.8% were from malignant gastric neoplasms and 14.7% from gastritis. In 10.8% the source of the hemorrhage remained obscure. All patients with gastrointestinal bleeding, regardless of the origin, first underwent conservative therapy, which in 90.7% of the patients was effective. In the 9.3% in which conservative treatment failed, bleeding was from a peptic ulcer or esophageal varices. Laparotomy for diagnosis was necessary in 33 of the cases treated surgically; this was performed as an emergency operation while the bleeding continued. The source of hemorrhage was found in 20 of these patients. Failure to operate would have resulted in faulty diagnosis and errors in treatment. Resection was used whenever possible to arrest bleeding ulcers. In gastrointestinal hemorrhages of obscure etiology diagnostic laparotomy and gastroduodenotomy should be employed. Of the 33 resectioned patients 7 died; palliative operations were performed when it became apparent that the patient would not survive radical surgery. These included such measures as stitching the bleeding vessel and local dissection of the source of hemorrhage (ulcer, polyp). Two patients died after laparotomy from bleeding ulcers not discovered during surgery.

5034 ANALYSIS OF COMPLICATIONS IN THE COURSE OF SALMONELLOSIS DUE TO *SALMONELLA ENTERITIDIS* GÄRTNER. *(Pol.)* Burchardt, B. (Acad. Med., Poznań, Poland) and L. Jezowa. *Wiad Lek* 20(17):1599-1603, 1967.

5035 HEPATIC AMEBIASIS RUPTURED INTO THE BRONCHI. *(Sp.)* Sapunar, J. (Hosp. J. J. Aguirre, U. Chile, Santiago), M. A. Muñoz and J. Castro. *Bol Chile Parasit* 22(2):60-65, 1967.

5036 A CASE OF SEVERE HEMORRHAGIC DIATHESIS IN THE COURSE OF COELIAC DISEASE. *(Pol.)* Machalski, M. (Acad. Med., Katowice, Poland), Z. Foremny and B. Wojtacha-Wencel. *Wiad Lek* 20(17):1653-1655, 1967.

5037 ETIOLOGY OF CHRONIC DIARRHOEA IN NORTH INDIAN CHILDREN. *(E.)* Walia, B. N. S. (All-India Inst. Med. Sci., New Delhi), J. K. Sidhu, B. N. Tandon and O. P. Ghai. *J Trop Med Hyg* 70(12):303-306, 1967.

5038 BACTERIOLOGICAL STUDIES ON SHIGELLOSIS IN SHIRAZ. *(E.)* Haghighi, L. (Dept. Microbiol., Pahlavi U., Shiraz, Iran) and S. M. Gettner. *J Trop Med Hyg* 70(12):297-299, 1967.

5039 SERUM PROTEINS IN KWASHIORKOR AND MARASMUS: 1. UNSELECTED SERIES BEFORE TREATMENT. *(E.)* Chatterjee, S. (Calcutta Sch. Trop. Med., India), A. K. Bhattacharyya and J. N. Mandal. *Bull Calcutta Sch Trop Med* 16(2):35-36, 1969.

5040 NIRIDAZOL IN THE TREATMENT OF BILHARZIASIS. *(Por.)* Ferreira, F. S. da C. *J Soc Cien Med Lisboa* 133(5):411-415, 1969.

5041 ON THE INTOLERANCE OF CERTAIN FOODS AND DRUGS IN LAMBLIASIS. *(Pol.)* Batko, B. (Milit. Hosp., Gliwice, Poland). *Wiad Lek* 20(17):1595-1598, 1967.

5042 REPEATED VOMITING IN INFANTS DUE TO FUNCTIONAL OR ANATOMICAL FUNCTIONAL DISORDERS OF THE UPPER DIGESTIVE TRACT. (CLINICAL EXPERIENCE OF THE AUTHORS.) *(Cz.)* Fargašová, I. (Med. Fac. Palacky U., Olomouc, Czechoslovakia) and K. Benda. *Cesk Pediat* 24(4):331-336, 1969.

GENERAL

5043 PATHOLOGY OF GASTROINTESTINAL HELMINTHIASES. *(Rev.)(E.)* Symons, L. E. A. (Div. Anim. Hlth., C.S.I.R.O., Glebe, Australia). *Int Rev Trop Med* 3:49-100, 1969.

5044 THE CHALLENGE OF AMOEBIASIS: UNDERSTANDING PATHOGENIC MECHANISMS. *(Rev.)(E.)* Biagi-F., F. (Fac. Med., Natl. U. Mexico, Mexico City) and F. Beltrán-H. *Int Rev Trop Med* 3:219-239, 1969.

5045 GASTROINTESTINAL BLEEDING DUE TO SALICYLATES. *(Heb.)* Anonymous *Harefuah* 76(11):517-519, 1969.

5046 MULTIFOCAL LYMPHOMA OF THE GASTROINTESTINAL TRACT. *(Heb.)* Gutsfeld, F. (Beth Tel-Hashomer, Israel). *Harefuah* 76(11):523, 1969.

5047 WHIPLASH ABDOMINAL INJURY. *(E.)* Berardi, R. S. (McDowell Regional Hosp., Ky.). *J Kentucky Med Ass* 67(7):501-503, 528, 1969.

5048 IATROGENESIS IN GASTROENTEROLOGY. *(Sp.)* Louis, C., C. E. (Sch. Med. Cent. U. Venezuela, Caracas). *GEN* 23(3):241-336, 1969.

5049 A CONTRIBUTION TO THE STUDY OF THE DIGESTIVE APPARATUS IN SCLERODERMA. *(It.)* Gaglio, M. (Inst. Gen. Med. Clin. Med. Ther., U. Catania, Italy). *Arch Ital Mal Appar Dig* 35(5):486-492, 1969.

5050 A FATAL CASE OF INTESTINAL HEMORRHAGE CAUSED BY TUBERCULOUS ENTEROCOLITIS ASSOCIATED WITH HEPATIC AND PULMONARY LESIONS. [CASE REPORT] *(Por.)* Salgado, J. A. (Fac. Med., U. Federal Minas Gerais, Belo Horizonte, Brazil), C. Silva and A. V. Magalhães. *Rev Ass Med Minas Gerais* 19(2): 153-156, 1969.

5051 ELECTRIC-POTENTIAL DIFFERENCE–A NEGLECTED PARAMETER OF GUT INTEGRITY AND FUNCTION? *(Rev.)(E.)* Geall, M. G. and W. H. G. Summerskill. *Gut* 10(6):418-421, 1969.

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Starting with Volume 3, Number 1, the SUBJECT and AUTHOR INDEXES have been generated directly from computer stored files. The Indexes to prior volumes were manually prepared.

The Subject Index uses a system of permuted *major class* terms combined with SEE and SEE ALSO references. A *major class* term is one embracing a broad concept which can be broken down into *minor class* terms.

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